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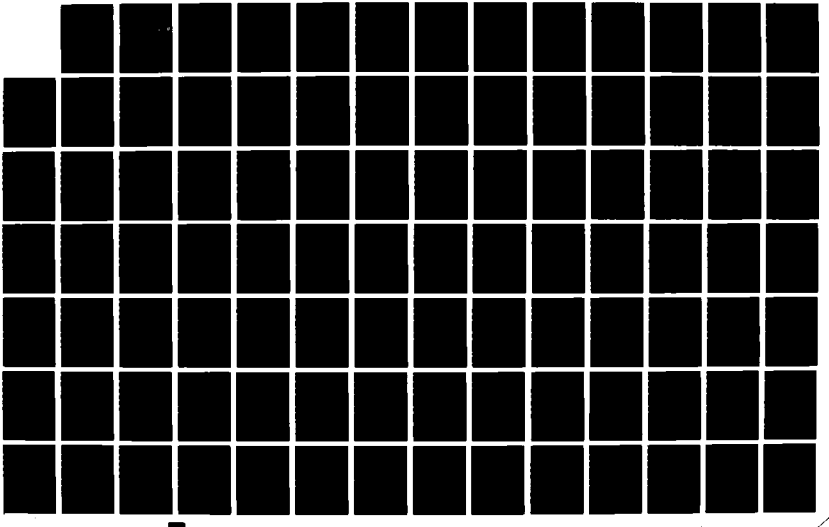

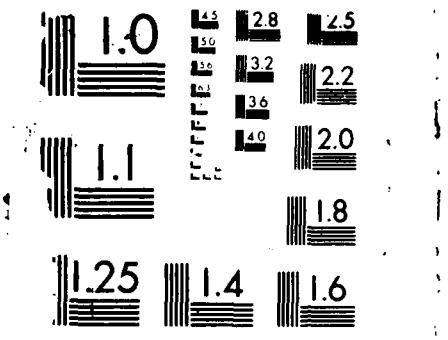

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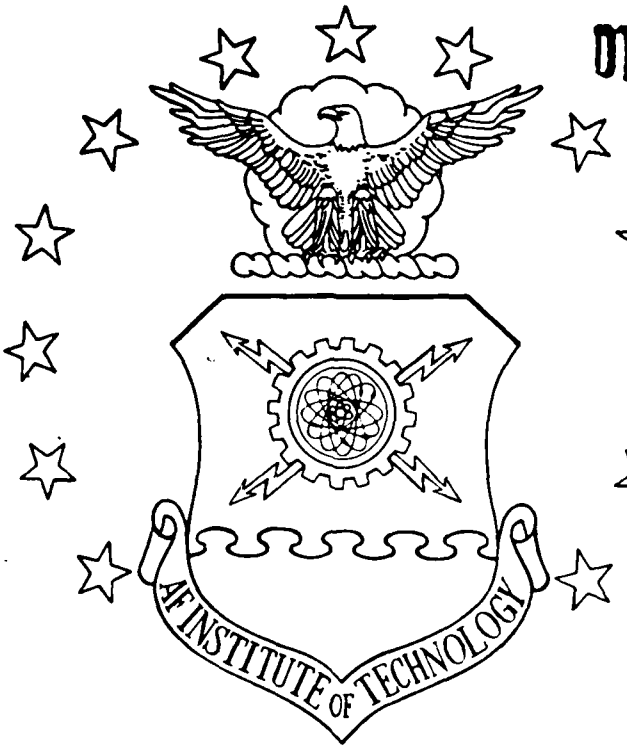

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EVALUATION OF CIVIL ENGINEERING WORK GROUP CHARACTERISTICS RESULTING FROM AN OPERATIONS BRANCH REORGANIZATION

THESIS

Kyle C. West
Captain, USAF

AFIT/GEM/LSR/87S-25

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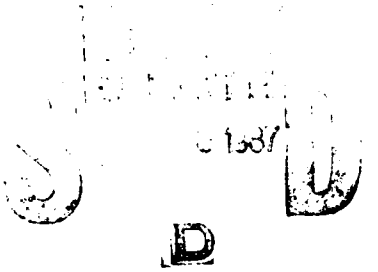

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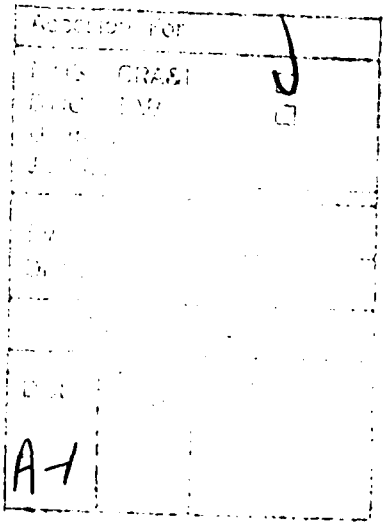

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AFIT/GEM/LSR/87S-25

EVALUATION OF CIVIL ENGINEERING WORK GROUP CHARACTERISTICS RESULTING FROM AN OPERATIONS BRANCH REORGANIZATION

THESIS

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the

Requirements for the Degree of

Master of Science in Engineering Management

Kyle C. West, B.S.

Captain, USAF

September 1987

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Kyle C. West

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Abstract

The purpose of this study was to evaluate from the perspective of group behavior the reorganization of Strategic Air Command (SAC) Civil Engineering Operations Branches into maintenance work groups. The study had three basic objectives: (1) Evaluate the validity and the reliability of the survey instrument used in the study; (2) Evaluate the usefulness of a theoretical group behavior model as a group behavior measurement tool; (3) Compare the job related attitudes, group characteristics, group processes, and perceived group effectiveness within a reorganized Operations Branch to the job related attitudes, group characteristics, group processes, and perceived group effectiveness within a non-reorganized Operations Branch.

The study resulted in the validation of the survey instrument and verification that the theoretical group behavior model could be used as a group behavior measurement tool in the field.

The reorganized Operations Branch was perceived by the survey respondents to be more effective and to have better supervision than the non-reorganized Operations Branch. No significant differences in job related attitudes, group cohesion, roles, communication, decision making, or unit

development were found between the reorganized Operations Branch and the non-reorganized Operations Branch. Recommendations made as a result of these findings include: conduct a longitudinal study with additional bases and collect specific production measures so that the survey results may be compared and verified using common production measures.

This study did establish a foundation on which an accurate assessment of change in organizational processes can be made. The validation of the survey instrument and group behavior model provides that foundation.

EVALUATION OF CIVIL ENGINEERING WORK GROUP CHARACTERISTICS RESULTING FROM AN OPERATIONS BRANCH REORGANIZATION

I. Introduction

This chapter contains a general background on the proposed reorganization of an Air Force Civil Engineering Operations Branch and a description of the group behavior model used to evaluate this reorganization. This chapter also presents the specific purpose of this thesis research project by providing a problem statement that includes specific research objectives and questions. The final portion of this chapter consists of the scope and limitations of the study, assumptions, and definitions of terms frequently used in the research.

Background

Strategic Air Command (SAC) has recently emphasized two major Civil Engineering areas of interest. The first area of interest involves the organization of Civil Engineering Operations Branches into maintenance groups that will be assigned to specific geographical zones on each base (15:1). SAC anticipates that making maintenance groups responsible for specific zones within a base area will have positive effects on productivity of the work force. For example, Peters and Austin, authors of A Passion For Excellence, identified a significant increase in many organizations'

production quantity and product quality (27:278-281). This increase resulted from allowing employees to become more responsible for the end product by assigning equipment, systems, or facilities to the individuals or groups. SAC has proposed that giving an employee accountability for job accomplishment instills "a feeling of ownership," thereby, "promoting pride, professionalism, and individual dignity" (15:2-3).

A second area of Civil Engineering interest is "[the maintenance] or [improvement of] wartime capability so that a civil engineering squadron would not have to reorganize to fight on the first day of war" (15:3). In order to investigate these areas of interest, the senior engineering leadership within SAC created a Special Project Team with the following goal:

> ...investigate the possibility of applying the ownership/accountability concept to the Operations Branch with the intention of increasing pride and professionalism in daily activities while improving our ability to transition to a wartime posture (15:3).

SAC's ability to achieve this goal was assessed, in part, by studying an Operations Branch which has been reorganized into maintenance work groups and then comparing it to an Operations Branch which has not been reorganized. Jewell and Reitz, authors of Group Effectiveness in Organizations, state:

> "The advantages of groups in accomplishing objectives are attributable to the greater pool of resources, talents, and information they can bring to bear compared with those of any individual" (17:13).

The effectiveness of one group over another within an organization, however, can be expected to vary.

The degree to which the effectiveness of the work groups vary can be measured by comparing the outcomes of each group. Outcomes are the products or processes produced by the group, such as job orders or work orders but may also include outcomes such as group cohesion. The differences in group outcomes may result from differences in variables like group characteristics or group processes. Jewell and Reitz proposed a method for modeling the relationship between "group outcomes" and "determinants of group outcomes" and called it "A Model of Group Behavior" (17:141).

$$\text{Group Outcomes} = f(IC, GC, GP, PE, SE) \qquad (1)$$

where:
- IC = characteristics of individual group members
- GC = characteristics of the group as a group
- GP = group processes
- PE = the group's physical environment
- SE = the group's social environment

Use of this model as a tool to study group behavior of newly formed work groups was investigated in this thesis.

A study of group behavior is an appropriate step to determine if the proposed reorganization has been successful in accomplishing the objectives set forth by the Special Project Team. The two major areas of emphasis in the group behavior portion of this thesis are group characteristics and group processes and are discussed in the literature

review. The precise relationships between group processes and group characteristics are also discussed in Chapter II.

Problem Statement

The reorganization of SAC Civil Engineering Operations Branches was proposed as a method to improve organizational productivity and effectiveness. The reorganization may also result in improved individual job related attitudes, group behavior, group processes, and group effectiveness. The basic problem addressed in this research was to evaluate the effect of the Operations Branch reorganization by comparing individual job related attitudes, group behavior, group processes, and group effectiveness of a reorganized Operations Branch to the job related attitudes, group behavior, group processes, and group effectiveness of a non-reorganized Operations Branch.

In addition to researching the intended, as well as unintended, outcomes in individual job related attitudes, group behavior, group processes, and group effectiveness, a foundation was established on which an accurate assessment of change in organizational processes can be made. Measurement instruments were developed and validated, and factors attributable to the reorganization were examined.

Research Objectives

The overall objective of this research was to expand on a study being conducted by a SAC Special Project Team by gathering data focusing on the area of group behavior.

Specific research objectives for this study were to:

1. Validate the measurement instrument used by the SAC team.

2. Evaluate the usefulness of the Jewell and Reitz group behavior model as a group behavior measurement tool.

3. Compare the job related attitudes of the personnel (craftsmen, foremen, superintendents, and upper level managers) of a reorganized Operations Branch to the job related attitudes of the same personnel in a non-reorganized Operations Branch.

4. Compare the group characteristics of reorganized Operations Branch work groups to the group characteristics of non-reorganized Operations Branch work groups.

5. Compare the group processes of reorganized Operations Branch work groups to the group processes of non-reorganized Operations Branch work groups.

6. Compare the effectiveness of reorganized [illegible] Branch work groups with the effectiveness of non-reorganized Operations Branch work groups.

Specific Research Questions

In order to accomplish the research objectives, data were collected to answer the following questions:

1. What are the psychometric qualities of the survey used by SAC to assess individual and group effects of the Operations Branch reorganization? (Objective 1)

2. What are the relationships between selected group related variables? (Objective 1)

3. Is the Jewell and Reitz group behavior model useful to model and measure group behavior that has been operationalized as group cohesion? (Objective 2)

4. What are the differences in job related attitudes between reorganized Operations Branch personnel and non-reorganized Operations Branch personnel? (Objective 3)

5. What are the differences in group characteristics between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups? (Objective 4)

6. What are the differences in the group processes between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups? (Objective 5)

7. What are the differences in the effectiveness between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups? (Objective 6)

Scope and Limitations of Study

This study was limited to the evaluation of data obtained from two northern tier, single flying wing, SAC bases during the research period of March-April 1987. Data were collected on individual job attitudes, group behavior characteristics, group processes, and group effectiveness. One base (Base R) was selected as the experimental group since it was scheduled for reorganization during the research period. The other base (Base N) was selected as

the control group because it was not scheduled for reorganization, but was similar to Base R in size, location, and mission.

Assumptions

The following assumptions were made in this research:

1. The two bases represent comparable SAC bases.

2. Any differences in survey results are likely to be a function of individual differences of the two base Civil Engineering organizations.

3. Existing differences in Operations Branch effectiveness between the two bases are caused by variances in group characteristics and group processes.

Definitions

The following terms are used frequently throughout this thesis and are defined as follows:

Group - All the personnel that report to the same supervisor.

Group Cohesiveness - "The strong attraction to the group by its members" (17:5).

Group Effectiveness - Degree to which the group accomplishes the tasks that it is assigned to accomplish (30:42).

Group Processes - Processes, such as communications and decision-making, which take place within the group.

Group Roles - "Set of expected behavior patterns attributed to someone occupying a given position in a [group]" (28:72).

Summary

The reorganization of Civil Engineering Operations Branches appears to be at least one solution for increasing or improving organizational effectiveness. The purpose of this thesis research project is to analyze the proposed reorganization of Operations Branches into maintenance work groups using the perspective of group behavior. Chapter II provides a review of group behavior literature to provide better insight into the effects of individual attitudes, group characteristics, group processes, and group effectiveness on an Air Force organization made up of work groups.

II. Literature Review

A detailed literature review was conducted to further the understanding of the effects of individual attitudes, group characteristics, group processes, and group effectiveness on organizational group behavior. Specific attention was focused on the use of the Jewell and Reitz Model of Group Behavior as a measurement tool for evaluating differences between a reorganized Operations Branch and a non-reorganized Operations Branch. In addition, the applicability of the model in an actual field setting was examined.

Group Behavior Model

Jewell and Reitz developed their group behavior model for the purpose of studying and modeling the relationships of group behavior in organizational settings (17:141). The group behavior model proposed by Jewell and Reitz is:

$$\text{Group Outcomes} = f(IC, GC, GP, PE, SE) \qquad (1)$$

where:
- IC = characteristics of individual group members
- GC = characteristics of the group as a group
- GP = group processes
- PE = the group's physical environment
- SE = the group's social environment

For the purpose of this research, the groups' physical environment was not studied. No data were collected for the physical environment variable because the group members in

an Operations Branch typically work in a dispersed mode throughout a large area. The Jewell and Reitz group members, in contrast, worked in relatively close physical proximity to one another. Except for this single exception, the Jewell and Reitz model was followed exactly.

Group Outcomes. Jewell and Reitz refered to group outcomes as either external or internal. "External outcomes are products or processes produced for or directed toward the group's environment" (17:142). For this research, the environment is identified as the Air Force base for which the Operations Branch is responsible. The products that the Operations Branch personnel must produce include completed work orders, job orders, and recurring maintenance work (boilers, airconditioning systems, heating systems, and other systems for which maintenance is accomplished on a recurring basis).

"Internal outcomes are products or processes produced for, or directed toward, the group itself, or one or more of its members" (17:142). The products include satisfaction with the group or its leader, internal influence, and cohesion. Cohesion is also an independent variable and is classified in this research as a group characteristic.

Determinants of Group Outcomes

Group Member Characteristics. The characteristics of group members (skills, abilities, and knowledge), often have a measurable effect on a group's performance. Groups

consisting of members with higher skills, abilities, or knowledge, often out-perform groups that have members with lower skills, abilities, or knowledge (19:107-110).

Internal outcomes, such as cohesion, satisfaction with group, and conformity, can also be affected by individual characteristics (intelligence, sex, and personality). The literature suggests that the more intelligent an individual is, the more willing that individual is to listen to differing viewpoints, but not necessarily to accept them. Intelligent individuals also "tend to be more active and popular" (17:143).

The "importance of knowing the sex composition of the group in order to predict behavior" (16:201-203) has been demonstrated in many studies over the past 47 years. In studies conducted by N. P. Mukerji, 1940, Germaine de Montmollin, 1952, and Raymond B. Cattell and Edwin Lawson, 1962, similar conclusions were made. In all three studies, the researchers found that there can be a measurable difference in the task completion efficiency, problem solving techniques, and negotiation skills between males and females. The researchers concluded that the differences in task completion efficiency, problem solving techniques, and negotiation skills are not only associated with the physical differences of the two sexes, but are also associated with the social differences of the two sexes (12:86-116, 16:201). Knowing a work group's sexual composition may help to explain why that particular work group makes the decision

it does and why it may be more or less effective than another work group.

The personalities of individual group members may sometimes contribute to the group's performance. One might expect personnel that are better adjusted, less anxious, more dependable, and more socially sensitive, would generally increase the effectiveness of the group. The effects of the individual personalities of group members can often be associated with the cohesion of the group (17:144).

The impact and importance of the individual within an organization was vividly demonstrated in studies conducted at the Western Electric plant in Hawthorne, Illinois. While individuals had previously been considered by employers and some researchers as passive, relatively simple creatures, who only performed their tasks for monetary rewards, individuals within that Western Electric facility were found to be distinct, complex persons who were not strictly motivated by monetary factors (11:194).

Group Characteristics. Group characteristics include those characteristics which are a part of group composition and those characteristics which are a part of group structure.

Group Composition. Factors of group composition, a group characteristic, include homogeneity and compatibility (17:145). Homogeneity is the extent to which members' individual characteristics such as sex, age, race, abilities, or other traits are similar. Group behaviorists

M. E. Shaw, Daniel Katz, and Robert L. Kahn, all agree that the more homogeneous a group is, the more likely it is to be cohesive (18:126, 29). Behaviorists M. E. Shaw and Herbert H. Blumberg, et al., indicated, however, that the advantages of a heterogeneous group over a homogeneous group may include the group's ability to generally perform a greater variety of tasks well since the group members possess a greater variety of skills and abilities (2:92, 29).

Compatibility is the manner in which members of the same group are able to interact in a cooperative manner (35:229). Research generally supports the hypothesis that compatible groups are more productive than incompatible groups and members of compatible groups are more satisfied with their job situation than are members of incompatible groups (2:91).

Group Structure. Group characteristics related to group structure include cohesiveness, roles, and size.

Cohesiveness. Cohesiveness may influence more internal and external outcomes than any other group characteristic (17:144). The cohesiveness of a group may not only affect group outcomes, but may also affect the attitudes of the individual group members (4:105, 18:423, 26:521). As an individual's attitude improves, one may expect that the overall performance of the individual, as well as the group, may also improve. Katz and Kahn explained this correlation when they stated:

> The great advantage of the cohesive group is that its members can find in group responsibility and group achievement satisfaction for their individual needs for self-expression and self-determination, as well as affiliation (18:423).

Capt Brian S. Smith, in his thesis entitled "An Assessment of Work Group Cohesion and Productivity," found numerous factors which could be attributed to an employee's job attitude and the cohesiveness of the work group (31:8). Several authors have prepared lists of variables that influence cohesiveness, however, there are certain variables which reappear throughout the literature. These variables include: interdependence, supervisor influence, participation in goal setting, group size, similarities, communication, work group tenure, and rewards from group membership (11,17,28,31).

Interdependence is the degree to which the accomplishment of one task depends on the accomplishment of another task (31:8). For example, if one worker requires the assistance of another worker to complete a job, communication between the workers may increase as the dependence of one worker on the other worker increases. This increase in communication often leads to an increase in the cohesiveness of the group to which the communicators belong. Acceptance and agreement, by group members, of a common goal and the action required to accomplish that goal has been refered to as cooperative interdependence (4:100).

The relationship between a supervisor and a worker can contribute to the cohesion of the group in either a positive or negative manner. Positive influences on group cohesion may result when the worker-supervisor relationship is positive and when the supervisor is trusted by the subordinates (36:155). It is also possible, however, for positive influences on group cohesion to result from a negative worker-supervisor relationship. In this type of case, workers who experience a negative relationship with their supervisor may become more cohesive with one another as a method of shielding themselves from pressures which may arise from the negative relationship (11:369).

Negative worker-supervisor relationships may also result in negative influences on group cohesion. Workers that become dissatisfied as a result of the negative relationship may withdraw from the group, thus reducing the cohesion which may have previously existed. Once the dissatisfied worker leaves the group, however, cohesion may increase (36:155).

Participative goal setting enables group members to become more involved in the establishment of work group objectives (31:13). What effect does participative goal setting have on the cohesiveness of a group? Stephen P. Robbins stated that:

> ...although participative goals may have no superiority over [management] assigned goals when acceptance is taken as a given, participation does increase the probability that difficult goals will be agreed to and acted upon (28:35).

Such an agreement between group members has also been refered to as cohesion (28:35).

Group member similarity not only refers to the degree to which group member characteristics are similar, but also to the degree to which group member interests and attitudes are similar (31:18). Cartwright and Zander, in their study of the nature of group cohesiveness found that the greater the similarity among group members, the greater the attraction of the members to the group (4:99). Capt Smith, however, found that similarities in certain areas, such as uniformity in age, was not necessarily positively related to cohesion (31:78). The lack of empirical evidence that would allow for a conclusion to be reached on the nature of the similarity-cohesiveness relationship provides support for the continued research of this relationship.

Work group tenure is the length of time that a member has been a part of his or her work group. One may expect that the longer that members in a particular group have been together, the more familiar they are with one another, the better they understand each other's strengths and weaknesses, and thus, the greater the cohesiveness of their group. Group tenure studies conducted by Greene and Schriesheim in 1980 and Deep, Bass, and Vaughan in 1967 both resulted in the conclusion that group tenure and group cohesiveness are positively related (7,14).

Rewards from group membership is the perception that membership in the group enables the employee to accomplish

something significant, resulting in the receipt of some type of reward (i.e., pay, promotion, or respect) (31:26). The work group member that perceives a receipt of high rewards from the group may improve his or her efforts within the group, thereby increasing the cohesiveness of the work group. As Cartwright and Zander stated:

> A person's actual attraction to the group may be expected to depend upon the magnitude of the rewards or costs afforded by the group but also upon his assessment of the likelihood that he will in fact experience them as a result of membership. Attraction to group depends, then, upon the expected value of the outcomes linked to membership (4:96).

The list of variables presented earlier that influence cohesiveness also included group size and communication. The influence of these two variables on group cohesiveness have not been ignored, but have been discussed in separate sections. Group size is discussed in the group structure section of this literature review and communication is discussed in the group process section.

Roles. There are certain consistent attitudes and behaviors which the individual occupying a specific position within an organization is expected to exhibit. These attitudes and behaviors have been refered to as role identity (28:72).

Role perception is the way an individual perceives that he or she is to act in a particular situation, while role expectations is how other people think that individual should act in the same situation (28:73). In some cases,

the role of an individual may be identified differently by the individual occupying the role than by other people either inside or outside the group.

Differences between role perception and role expectation produces role conflict according to Daniel Katz and Robert L. Kahn. In their discussion, they reported that the presence of role conflict often leads to conflicts that can be associated with "anxiety, tension, and reduced effectiveness" (18:220-221). The manner in which an individual resolves these role conflicts and the resultant behavior patterns that an individual adopts have been shown to contribute to the effectiveness of his or her work group (17:21-22, 28:74-75).

An organizational role system, the pattern of roles which exist in an organization, developes through a process which entails discovering the expectations of others, accepting the expectations, and taking action consistent with the expectations (17:22, 18:188). When a particular role system changes, as would be expected to occur as a result of the Civil Engineering Operations Branch reorganization, individual role perceptions and expectations also change (17:22). An individual unsure of his or her new role, may revert to the same role he or she occupied in the previous role system until a new role is established.

Size. Cummins and King in their study entitled "The Interaction of Group Size and Task Structure in an Industrial Organization" stated that:

> From a manager's viewpoint, group size and task structure are the two determinants of group behavior most directly under his control... (6:87).

They concluded that for highly structured tasks there is a positive relationship between the group size and productivity relationship, but for relatively less structured tasks there was neither a positive or negative relationship between group size and productivity. Cummins and King also determined that the size of the group appears to have an inverse effect on group cohesiveness (6:87-92).

Manners investigated the relationship of group size, group problem solving, and member consensus and found that 42 percent of the variance in group performance could be accounted for by group size (22:715). Manners also found, as did Cummings, Huber, and Arendt that if the quality of a group solution is the most important factor, then the group should be composed of seven to twelve members and if the degree of consensus is the most important factor, then the group should be composed of three to five members (5, 22). These studies indicate that there is a definite relationship between group size and group effectiveness.

In general, the literature suggests that the structural characteristics of a group are related to the behaviors observed and measured within the group in addition to the measures of group performance. Structural characteristics of a group are therefore included in this thesis research project.

Group Processes. Group processes refer to the manner in which a group communicates, influences members, makes decisions, cooperates, and competes (17:147). Jewell and Reitz propose that the two group processes of communication and decision making are expected to have the greatest influence on group outcomes. Further investigation into the validity of this assumption was conducted in this research project.

Communication. Nord acknowledged the critical need for good communication between organization members when he stated:

> "Communication is crucial to organizations. Only through information transmission can the efforts of people be coordinated so that the organization can respond effectively to its environment" (26:471).

Katz and Kahn also recognized the importance of good communication and stated that "[communication] is the very essence of a social system or an organization" (18:428).

Effective group communication generally contributes positively to the cohesiveness of that group. Lott and Lott found that a positive relationship between cohesion and communication is possible even in a neutral atmosphere, as long as there are opportunities available for oral communication (21:262).

The literature suggests that communication is a vital factor in the way in which a group operates, and offers a better understanding of the communication process in groups.

The other group process factor which was studied in this thesis is the decision making process.

Decision Making. The decision making process affects the external outcomes of a group. The advantages of group decision making over individual decision making include increased acceptance of proposed solutions by the group, availability of a wider knowledge base, and availability of more information from which a solution may be selected (28:107-108). Disadvantages include time consumption, pressures to conform, and ambiguous responsibility (28:108).

The actual steps taken in the decision making process appear to be similar for individuals and groups alike. Robbins developed an "Optimizing Decision Model" for individual decision making, consisting of the following steps:

1. Ascertain the need for a decision.
2. Identify the decision criteria.
3. Allocate weights to the criteria.
4. Develop the alternatives.
5. Evaluate the alternatives.
6. Select the best alternative (28:58).

The steps in the group decision making process have been identified by Nobel prize winner Herbert A. Simon as:

1. Identify the problem.
2. Develop several alternatives.

3. Evaluate and select best alternative.

4. Review results (13:35).

Simon's and Robbins' decision making steps do not appear to be substantially different, although the way in which a group conducts each decision making step is likely to be different from the way in which an individual conducts each step. Perhaps the biggest difference between group and individual decision making is that "A cohesive group of individuals sharing a common fate exerts even greater pressures toward conformity" (18:514). This type of conformity may be good in some cases, however, in a case where the group decision is wrong (e.g., guilty verdict by a jury for a non-guilty person), the decision can be extremely detrimental.

The choice of whether to use an individual or a group to do the decision making will depend on the situation or type of problem to be solved and the time available in which to make the decision (28:107-111). The advantages and disadvantages of either approach must be weighed by the supervisor prior to beginning the decision making process.

Group's Social Environment. The group's social environment consists of the reward system and goals within the group. Jewell and Reitz outlined the results of the reward system in the following manner:

> Within the group, systems by which members share relatively equally in group rewards tend to promote cooperation and cohesion. Systems by which members are rewarded differentially, with

> relative rewards based on each individual's actual or adjudged relative performance, promote competition (16:150).

For a group goal to be obtained, the goal must be agreed upon by enough members to encourage them to work toward it. The basic benefit of a goal is that it becomes a source of motivation to the group. Latham and Yukl found that when a goal is specific and/or difficult, the group working toward that goal tends to demonstrate an increase in performance (20). The existance of rewards and goals within a group seem to provide a definite influence on group outcomes, and are therefore studied in this thesis research project.

Attitudes

The relationship between an individual's attitude and his or her behavior, was once thought to be ambiguous. Robbins studied this attitude-behavior relationship, however, and found that an individual's behavior is usually influenced by the individual's attitude (28:14). There are other researchers that do not necessarily agree with Robbins' findings. Charles N. Greene and Robert E. Craft, Jr. studied three basic propositions: (1) Satisfaction causes performance. (2) Performance causes satisfaction. (3) Satisfaction and performance are caused by other variables such as rewards. Greene and Craft concluded that satisfaction and performance are caused by other variables, particularly rewards, as did Steven Kerr in his study

entitled "On the Folly of Rewarding A, While Hoping for B" (33:55-63, 34:270-284).

Job satisfaction is defined as the attitude that an individual has toward his or her job (23:303). Robert C. Beck studied the relationship of job satisfaction to performance and concluded that the Lawler-Porter hypothesis that: "Performance which leads to rewards produces satisfaction with the work and the expectation that future performance will also lead to rewards" (1:392) is valid. Thus, good performance may lead to high job satisfaction rather than high job satisfaction lead to good performance.

The lack of empirical evidence in the literature seems to support the need for additional study of the attitude-behavior relationship. For this reason, a study of this relationship was included in this thesis research in hopes of finding additional information that may support the attitude-behavior relationship described by Robbins.

Effectiveness

The effectiveness of a group is the degree to which the group accomplishes the tasks that it is assigned to accomplish. Sink identified three criteria needed to evaluate a group's degree of effectiveness:

1. Quality: Did we do the "right" things according to predetermined specifications?
2. Quantity: Did we get all of the "right" things done?

3. Timeliness: Did we get the "right" things done on time? (30:42)

The following equation can be used to measure effectiveness:

$$\frac{\text{output achieved}}{\text{output planned}} \qquad (2)$$

Effectiveness is therefore a measure of organizational or group performance, based on the outputs of the organization or group being measured (19:96, 30:42).

Research Questions and Hypotheses

Based on the literature reviewed in this chapter, hypotheses were developed for the research questions listed in Chapter I.

Research Question #1. What are the psychometric qualities of the survey used by SAC to assess individual and group effects of the Operations Branch reorganization?

Hypothesis 1.1. The reliability and validity of the survey will be sufficient to substantiate use of the survey.

Research Question #2. What are the relationships between selected group related variables?

Hypothesis 2.1. There is a significant, negative correlation between group cohesion and group size.

Hypothesis 2.2. There is a significant, positive correlation between group cohesion and job satisfaction.

Hypothesis 2.3. There is a significant, positive correlation between group cohesion and supervision.

Hypothesis 2.4. There is a significant, positive correlation between group cohesion and job position tenure.

Hypothesis 2.5. There is a significant, positive correlation between group cohesion and group effectiveness.

Hypothesis 2.6. There is relatively no correlation between group cohesion and roles.

Hypothesis 2.7. There is a significant, positive correlation between group cohesion and communication.

Research Question #3. Is the Jewell and Reitz group behavior model useful to model and measure group behavior that has been operationalized as group cohesion?

Hypothesis 3.1. The Jewell an Reitz group behavior model will account for a significant amount of variability in group cohesion.

Research Question #4. What are the differences in job related attitudes between reorganized Operations Branch personnel and non-reorganized Operations Branch personnel?

Hypothesis 4.1. The job related attitude responses of the reorganized Operations Branch personnel are significantly higher than the job related attitude responses of the non-reorganized Operations Branch personnel.

Research Question #5. What are the differences in group characteristics between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups?

Hypothesis 5.1. The group cohesion of the reorganized Operations Branch work groups is significantly

higher than the group cohesion of the non-reorganized Operations Branch work groups.

Hypothesis 5.2. There is no significant difference in roles between the reorganized Operations Branch work groups and the non-reorganized Operations Branch work groups.

Research Question #6. What are the differences in the group processes between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups?

Hypothesis 6.1. The communication, responsibility, and independence levels are significantly higher in the reorganized Operations Branch work groups than in the non-reorganized Operations Branch work groups.

Research Question #7. What are the differences in the perceived effectiveness between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups?

Hypothesis 7.1. The perceived group effectiveness is significantly higher for the reorganized Operations Branch work groups than the non-reorganized Operations Branch work groups.

Summary

The current literature seems to indicate that a measurable difference between the group behaviors and perception of effectiveness of reorganized work groups and non-reorganized work groups can be expected as a result of the Operations Branch reorganization. The literature also

provides the means, in the form of a group behavior model, by which the differences in group behavior can be measured.

Chapter III discusses the procedures used to validate the survey instrument used to gather group behavior data, evaluate the group behavior model's usefulness as a group behavior measurement tool, and measure the differences in group behavior between a reorganized Operations Branch and a non-reorganized Operations Branch.

III. Methodology

This chapter describes the methodology used to accomplish the research objectives, answer the research questions, and evaluate the hypotheses listed in Chapters I and II. Included in this chapter is a discussion of the populations and samples from which the data were collected, the instrument used to collect the data, the procedures used to process the data, and the computer programs and statistical tests used to analyze the data.

Population

The population of interest in this research consists of all United States Air Force Civil Engineering Operations Branch personnel within Strategic Air Command (SAC). The population is limited to SAC Civil Engineering personnel because SAC is the command in which the reorganization is being conducted.

According to HQ SAC/DERI and Air Force manpower authorization figures, the SAC population consists of [illegible] personnel. The population count includes all permanent civilian and military personnel who work within SAC Civil Engineering Operations Branches.

Sample

The sample from which the data was collected for this research consists of 420 authorized Civil Engineering

Operations Branch personnel at Base R and 342 authorized Civil Engineering Operations Branch personnel at Base N. A total sample size of 368 personnel was required to allow for a 95 confidence level percent according to the following formula (8):

$$n = \frac{Nz^2p(1-p)}{(N-1)d^2+z^2p(1-p)} \qquad (3)$$

where:
- n = sample size
- N = population size (8355)
- p = maximum sample size factor (0.5)
- d = desired tolerance (0.05)
- z = factor of assurance for 95 percent confidence level (1.96)

A survey return rate of only 24 percent was obtained. With 181 total surveys returned (52 from Base R and 129 from Base N), a maximum confidence level of 90 percent was met.

Survey Instrument

A survey questionnaire, consisting of two parts, was used to collect data for this research project. The purpose of part one was to collect data in the areas of individual job attitudes, group characteristics, group processes, and individual demographics. The purpose of part two was to collect data in the areas of group characteristics, group processes, individual job satisfaction, group size, group tenure, and group effectiveness.

Table I

Variables Assessed in Survey - Part I

Variable	Definition
Achievement	Feelings of accomplishment
Assignment Locality	Desirability of current assignment
Commitment	Belief in importance of AF mission
Communication	Free-flowing dialogue
Concern for Individual	Belief that management cares
Confidence in Mgt	Belief in commander's capability
Contribution	Individual has value, impact
Group Cohesion	Compatibility, cooperation
Identification	Member of special group or unit
Independence	Chance to work autonomously
Interest	Work compatible with personal needs
Job Satisfaction	Satisfaction with current job
Org Effectiveness	Optimal productivity
Pay, Benefits	Continued financial security
Personal Development	Opportunity for self-fulfillment
Promotion Opportunity	Promotion attainable
Recognition	Credit for work well done
Responsibility	Responsible for actions, decisions
Supervision	Supervisor's capabilities
Unit Development	Organizational quality
Utilization	Use of abilities, training
Working Conditions	Nature of immediate work area
Work Life	Quality of work life

(Variables and Definitions from 9:I-4)

The first part of the survey, the Organizational Climate Survey (OCS), consists of 130 questions and was developed by HQ USAF DCS/Manpower and Personnel (see Appendix A). The Air Force Military Personnel Center (AFMPC/DPMYOS) has been designated by the USAF as the functional manager for the OCS (9:i). The OCS was used to measure the items listed in Table I.

The second part of the survey consisted of 35 questions and was created specifically for this research project (see Appendix B). Table II lists the variables measured by Part II of the survey.

Table II

Variables Assessed in Survey-Part II

Variable	Definition
Communication	Free-flowing dialogue
Group Cohesion	Compatibility, cooperation
Group Effectiveness	Effectiveness of work group
Job Satisfaction	Satisfaction with current job
Roles	Expected behavior patterns
Size	Size of work group
Supervision	Supervisor's capabilities

Since the primary purpose of the survey was to collect as much data as possible, the questionnaire included format features that were intended to encourage maximum response.

Factors such as appearance, content, and simplicity were considered in the survey design and respondents were guaranteed anonymity.

Data Collection Plan

The survey was administered between March and April 1987 at each base. A second survey was to be administered approximately two months after the reorganization at Base R was complete, however, due to time constraints, it was not administered. The survey was administered at Base R by the Chief of Resources and Requirements. The survey was administered at Base N by the Chief of Industrial Engineering.

The OCS portion of the survey and scan sheets were obtained from AFMPC/DPMYOS. The second part of the survey was printed locally. All survey packages were sent to the survey administrators at each base for accomplishment.

At each base, the surveys were administered in a series of groups consisting of 15-20 personnel. Each survey respondent was briefed on the general objective of the survey, given oral and written instructions for filling out the survey, and given a brief written summary of the terminology used in the survey.

Upon completion, they were returned to this researcher and then forwarded to AFMPC/DPMYOS to have questions 1 through 139 read by an optical reader. The data were then returned to this researcher on a floppy disk and transfered

into the AFIT ASC computer system. Questions 140 through 165 could not be read by the AFMPC optical reader, therefore, questions 140 through 165 were manually entered into the AFIT ASC computer system by this researcher. Once all of the data were loaded, data analysis was conducted in accordance with the procedure outlined in the Data Analysis section of this chapter.

Data Analysis

An SPSS* (Statistical Package for the Social Sciences) computer program was used to analyze the data obtained from the survey questionnaires (see Appendix D). The sample size was sufficiently large to apply the Central Limit Theorem to this research. Thus, all data were assumed to have a normal distribution.

Survey Validation. The validity and internal consistency of the individual survey questions was assessed in two ways. First, Pearson correlations were compared for significant and expected values. Secondly, the reliability of particular composite variables was assessed. The composite variables were obtained by summing specific sets of individual questions.

Although the correlation between each composite variable in the survey was evaluated, emphasis was placed on the correlation between group cohesion and group size, job satisfaction, supervision, job position tenure, group effectiveness, roles, and communication. Based on the

literature reviewed and discussed in Chapter II, a significant, positive correlation between group cohesion, and job satisfaction, job position tenure, group effectiveness, supervision, and communication was expected. A significant, negative correlation between group cohesion and group size was expected, and no correlation between group cohesion and roles was expected.

Group Behavior Model Evaluation. The usefulness of the Jewell and Reitz group behavior model as a group behavior measurement tool was evaluated by using regression analysis to estimate a model composed of the following independent variables: group size, job satisfaction, supervisor's capabilities, job position tenure, group effectiveness, group roles, and communication, and the dependent variable, group cohesion. The amount of variability in group cohesion that could be explained by variation in any one of the seven previously identified independent variables was expected to be relatively high, based on findings from the literature discussed in Chapter II.

Job Related Attitudes. The differences in job related attitudes between reorganized Operations Branch personnel and non-reorganized Operations Branch personnel were determined by analyzing the frequency of response to a specific question. Evaluation of the distribution of responses can increase the understanding of the relationship between variables, provide a pattern so that predictions can be made when the surveys are used in the future, and provide

a means to evaluate the reliability and validity of the survey instrument (25:7). The mean frequency value of each question and the mean frequency value of each composite variable were also compared using a t-test so that significant differences between reorganized Operations Branch personnel responses and non-reorganized Operations Branch personnel reponses could be determined.

Group Level Variables. The differences in group characteristics, group processes, and group effectiveness between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups were determined by the same analysis procedures that were used for analysis of job related attitudes.

Summary

This chapter described the methodology used to accomplish the research objectives, answer the research questions, and evaluate the hypotheses listed in Chapters I and II. The research was conducted in three primary areas. First, the survey instrument was validated. Secondly, a theoretical group behavior model was evaluated for its usefulness as a group behavior measurement tool. Finally, job related attitudes, group characteristics, group processes, and group effectiveness of a reorganized Operations Branch was compared to job related attitudes, group characteristics, group processes, and group effectiveness of a non-reorganized Operation Branch.

Chapter IV discusses the data which was analyzed using the methodology described in this chapter.

IV. Data Analysis and Discussion

This chapter contains an analysis and discussion of the data obtained using the methodology described in Chapter III. The research, conducted in four primary areas, includes: survey instrument validation, model evaluation, individual attitude analysis, and group behavior analysis.

Survey instrument validation consisted of analyzing the questions used in the survey to ensure their validity and reliability. Evaluation of the group behavior model involved testing the model using data collected in this research project and analyzing effectiveness of the model. Individual attitude analysis involved determining and assessing differences in individual job related attitudes between reorganized Operations Branch personnel and non-reorganized Operations Branch personnel. Group behavior analysis involved determining and assessing differences in group characteristics, group processes, and group effectiveness between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups.

Survey Validation

Each individual survey question was analyzed to determine psychometric characteristics (see Appendix C). A Pearson correlation analysis and a reliability analysis were conducted.

Although the correlation values of the survey questions are widely distributed from low to high, approximately 75 percent of the correlation values (r) were greater than 0.40 and approximately 75 percent of the correlation probability values (p) were less than 0.05. Typical results appear in Table III.

Table III

Typical Correlation Analysis Results

Variable	Questions	r value	p value
Group Cohesion	5 & 35	0.56	0.000
Supervision	1 & 66	0.64	0.000
Job Satisfaction	121 & 123	0.80	0.000
Recognition	38 & 87	0.43	0.001

Each question was evaluated for validity. Question 154, a supervision question, was found to be invalid as a measurement of supervision. Question 154's correlation with the other supervision questions was not only low in every case, but was also negative in some cases. The results of the correlation analysis between question 154 and other supervision questions such as 42 ($r=-0.57$, $p=0.34$), 66 ($r=-0.13$, $p=0.18$), and 79 ($r=-0.004$, $p=0.49$) are typical of the results attained when question 154 was correlated with the other supervision questions. Further evaluation and

analysis of the question indicates that it should more properly be eliminated from the survey.

Although the correlation between each composite variable in the survey was measured, emphasis was placed on the correlation between group cohesion and group size, job satisfaction, supervision, job position tenure, group effectiveness, roles, and communication. The Pearson correlation values, along with the corresponding probability values which were evaluated, appear in Appendix E.

The reliability of all the composite variables was computed. The data in Table IV depict the coefficient alpha value for each of the twenty-four composite variables used in this study. The reliability of these variables are within an acceptable range.

Additional analyses were conducted to compare the reliability of the communication, contribution (roles), cohesion, and supervision questions asked in the first part of the survey to the communication, roles, group cohesion, and supervision questions asked in the second part of the survey. The data in Table V, indicate that with one exception, the questions asked in part two of the survey are apparently more reliable than the questions asked in the OCS portion of the survey for the variables listed. The one notable exception was the supervision variable which was discussed on the previous page.

Table IV

Reliability of Composite Variables

Variable	Coefficient Alpha
Achievement	0.74
Assignment Locality	0.82
Commitment	0.76
Communication	0.75
Concern for Individual	0.81
Confidence in Mgt	0.72
Contribution (Roles)	0.75
Group Cohesion	0.80
Group Effectiveness	0.83
Identification	0.85
Independence	0.70
Interest	0.85
Job Satisfaction	0.87
Organizational Effectiveness	0.68
Pay, Benefits	0.82
Personal Development	0.84
Promotion Opportunity	0.78
Recognition	0.76
Responsibility	0.75
Supervision	0.91
Unit Development	0.84
Utilization	0.76
Working Conditions	0.84
Work Life	0.77

Table V

Survey Question Reliability - Part I (OCS) vs Part II

Variable	Coefficient Alpha Part I (OCS)	Part II
Communication	0.68	0.82
Roles	0.62	0.88
Group Cohesion	0.72	0.88
Supervision	0.91	-0.13

Group Behavior Model Evaluation

The following Jewell and Reitz model of group behavior was modified for this research project:

Group Outcomes = f(IC,GC,GP,PE,SE) (1)

where: IC = characteristics of individual group members
GC = characteristics of the group as a group
GP = group processes
PE = the group's physical environment
SE = the group's social environment

The modified model is the same as the original model with the following exceptions: (1) The physical environment variable was eliminated since Operations Branch work groups operate in a significantly different physical environment than the Jewell and Reitz work groups. (2) The variables in the modified model are actually factors or elements of the variables in the original model (i.e., communication is a group process factor, group size is a group characteristic factor). Selection of the variables used as factors or elements was based on the literature discussed in Chapter II.

GC = f(GS,JS,S,JP,GE,R,C) (4)

where: GC = Group Cohesion
GS = Group Size
JS = Job Satisfaction
S = Supervision
JP = Job Position Tenure
GE = Group Effectiveness
R = Roles
C = Communication

The following regression analysis equation was constructed from the modified Jewell and Reitz model of group behavior:

$$GC = \alpha + \beta_1 GS + \beta_2 JS + \beta_3 S + \beta_4 JP + \beta_5 GE + \beta_6 R + \beta_7 C + e \qquad (5)$$

where: α = coefficient alpha value
β = standardized beta value
e = error

A regression analysis, based on equation (5) was conducted under the following assumption: The amount of variability in group cohesion that could be explained by variation in any one of the seven previously identified independent variables was expected to be relatively high. The results of the regression analysis appear in Tables VI-1 and VI-2.

Table VI-1

Regression Analysis - Base R

Variable	Standardized Beta Value
Group Size	3.739E-04
Group Effectiveness	0.175662*
Supervision	0.064562
Job Position Tenure	-0.081320
Job Satisfaction	-0.213330**
Roles	-0.076973
Communication	0.646852***

Multiple R Value = 0.87129 R Square Value = 0.75915
F Value = 19.81247*** Degrees of Freedom = 7

* $p < 0.10$
** $p < 0.05$
*** $p < 0.01$

Table VI-2

Regression Analysis - Base N

Variable	Standardized Beta Value
Group Size	0.039920
Group Effectiveness	0.200378***
Supervision	0.034386
Job Position Tenure	0.088593
Job Satisfaction	0.504201***
Roles	-0.219454*
Communication	0.488517***
Multiple R Value = 0.80972	R Square Value = 0.65563
F Value = 30.46381***	Degrees of Freedom = 7

* p < 0.10
** p < 0.05
*** p < 0.01

The multiple R value represents the degree of linear relationship between the dependent variable and the independent variables. According to Jay L. Devore, author of Probability and Statistics for Engineering and the Sciences, a strong correlation between variables exist when the R value is greater than 0.80 and less than 1.0 (10:449). The R values of 0.87 for Base R and 0.81 for Base N indicate a strong correlation between the independent variables and dependent variable at both bases.

The F value of 19.81 at Base R and 30.46 at Base N are both significant, indicating that the R Square values of 0.76 and 0.66 are also significant. The R Square value of 0.76 at Base R and 0.66 at Base N indicates that 76 and 66 percent, respectively, of the variability in group cohesion can be explained by variation in the seven independent

variables tested. The R Square values obtained at each base seem to indicate that the characteristics chosen as independent variables were good choices.

Additional meaning was obtained through the analysis of the standardized beta value. The standardized beta value is the amount of variability in the dependent variable that can be explained by variation in the independent variable for which the value is computed (10:455). The relationship between the independent variables can be explained by comparing standardized beta values. At Base R, the standardized beta value of 0.065 for supervision and 0.65 for communication indicates that the communication variable is ten times more important than the supervision variable in explaining variability in group cohesion. At Base N, the standardized beta value of 0.20 for group effectiveness and 0.50 for job satisfaction indicates that the job satisfaction variable is two and one half times more important than the group effectiveness variable in explaining variability in group cohesion.

Three of the standardized beta values at Base R and one at Base N are negative. The standardized beta value is an absolute value, however, and the only purpose of a negative sign is to ensure that all of the beta values sum to 1.0. Thus, the standardized beta value of -0.22 for roles and 0.20 for group effectiveness at Base N, indicates that the role variable and the group effectiveness variable are equally important in explaining group cohesion variability.

The Jewell and Reitz group behavior model proved to be a useful measurement tool of group behavior that has been operationalized as group cohesion. These results clearly indicate that the theoretical group behavior model can be used in the field.

Job Related Attitudes

Determining the differences in job related attitudes between reorganized Operations Branch personnel and non-reorganized Operations Branch personnel began with the selection of the job related attitude questions to be analyzed. The survey questionnaire consists of 165 questions, of which approximately 135 questions fall under the category of job related attitudes. Because of the large number of questions in the job related attitude category, nine specific variables were selected for analysis. The variables are presented in Table VII.

Table VII

Mean Total Responses
Job Related Attitude Variables

Variable	Mean Total Response	
	Base R	Base N
Identification	13.385	13.527
Interest	22.173	21.543
Job Satisfaction	21.173	22.023
Personal Development	19.058	19.140
Supervision	54.327	49.233
Unit Development	13.173	13.752
Utilization	21.308	22.116
Working Conditions	18.788	18.775

The selection of the composite variables in Table VII was based on the premise that a measurable difference in the mean responses for each composite variable will exist between the two bases. The resulting mean total responses to the job related attitude questions appear in Table VII.

Although the mean total responses of the two bases do not appear to be measurably different for any of the variables in Table VII, a t-test was conducted to determine if there are any significant differences in the responses between the two bases. The results of the t-tests appear in Table VIII.

Table VIII

T-Test Results
Job Related Attitude Variables

Variable	t Value	Prob
Identification	-0.19	0.847
Interest	0.48	0.632
Job Satisfaction	-0.73	0.466
Personal Development	-0.06	0.951
Supervision	2.34	0.021
Unit Development	-0.73	0.465
Utilization	-0.65	0.518
Working Conditions	0.02	0.985

The results of the job related attitude variable t-tests indicate that, except for supervision, there are no significant differences in the mean responses between the reorganized Operations Branch and the non-reorganized Operations Branch. The t value of 2.34 with a probability

value of 0.021 for the supervision variable indicate that there may be a significant difference between the perceived supervision of the reorganized Operations Branch work groups and the perceived supervision of the non-reorganized Operations Branch work groups.

Group Characteristics

The group characteristics selected for analysis of differences between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups included: cohesiveness, roles, and size. Each group characteristic was analyzed under the premise that a measurable difference in the mean response could be expected as a result of the Operations Branch reorganization. The results of the t-tests appear in Table IX.

Table IX

T-Test Results
Group Characteristic Variables

Variable	t Value	Prob
Group Cohesion	0.95	0.346
Group Roles	1.08	0.282
Group Size	3.05	0.003

The results of the group characteristic variable t-tests indicate that except for group size, there are no significant differences in the mean responses between the

reorganized Operations Branch and the non-reorganized Operations Branch. The t value of 3.05 with a probability value of 0.003 for t..e size variable indicate that there is a significant difference between the work group size at Base R and the work group size at Base N.

Further evaluation of the apparent difference in group size between the two bases verified the results obtained from the group size t-test. The mean group size within the Base R Operations Branch was indicated by the survey respondents to be somewhere between 11 and 20 personnel. The mean group size within the Base N Operations Branch was indicated by the survey respondents to be somewhere between six and 15 personnel. The differences in group size, however, does not appear in this sample to have any measurable effect on the other group characteristics; cohesiveness or roles.

Group Processes

The group processes selected for analysis of differences between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups included communications and group decision making. The composite variables categorized under group decision making included roles, responsibility, and independence, however, the role variable responses were previously analyzed and no significant differences in responses between bases were found.

The other variables; communication, responsibility, and independence, were analyzed under the premise that a measurable difference in the mean response could be expected as a result of the Operations Branch reorganization. The results of the t-tests appear in Table X.

Table X

T-Test Results
Group Process Variables

Variable	t Value	Prob
Communication	1.06	0.292
Independence	0.60	0.548
Responsibility	-0.92	0.358

The results of the group processes variable t-tests indicate that there are no significant differences in the mean responses between the reorganized Operations Branch work group processes and the non-reorganized Operations Branch work group processes.

Group Effectiveness

The differences in the group effectiveness between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups were analyzed by comparing the mean responses of the group effectiveness variable between bases. The use of specific production measures (i.e. production data, work order reports, etc.) would have made the group effectiveness analysis more

complete, but attempts made by this researcher to obtain the required production measures were unsuccessful. The measurement of differences in group effectiveness between Base R and Base N was based on the perception of the survey respondents. The analysis of difference in group effectiveness, between the two bases, was based on the premise that a measurable difference in the mean response to the group effectiveness variable could be expected as a result of the Operations Branch reorganization. The results of the t-test appear in Table XI.

Table XI

T-Test Results
Group Effectiveness Variable

Variable	t Value	Prob
Group Effectiveness	1.75	0.084

The t value of 1.75 with a probability value of 0.084 indicate that there is a relatively significant difference between the group effectiveness at Base R and the group effectiveness at Base N. Because the significance of the t-test appeared somewhat uncertain, additional analysis of the differences in group effectiveness was conducted. Additional variables related to the perceived quality and productivity of the organization were analyzed. The variables, organizational effectiveness and unit development, were identified during the literature review as

criteria useful to evaluate degree of effectiveness. These variables were also chosen as surrogate measures of group effectiveness under the assumption that the individual survey respondents would perceive their unit's development and organization's effectiveness to be the same as their group's effectiveness. The results of the t-tests appear in Table XII.

Table XII

T-Test Results
Additional Group Effectiveness Variables

Variable	t Value	Prob
Organizational Effectiveness	2.01	0.047
Unit Development	-0.73	0.466

The results of the additional group effectiveness variable t-tests indicate that there are no significant differences in the mean responses between the reorganized Operations Branch and the non-reorganized Operations Branch for the unit development variable, but there is a significant difference in the responses for the organizational effectiveness variable. The t value of 2.01 with a probability value of 0.047 for the organizational effectiveness variable indicate that there is a significant

difference between the perception of organizational effectiveness at Base R and at Base N.

Summary

This chapter has consisted of an analysis and discussion of the research conducted in the areas of: survey instrument validation, group behavior model evaluation, individual attitude analysis, and group behavior analysis. The results and conclusions, based on the research objectives and questions listed in Chapter I and the data analysis presented in this chapter, are summarized in Chapter V.

V. Results and Conclusions

This chapter contains the results and conclusions of the research questions and hypotheses based on the results of the data analysis discussed in Chapter IV. It also suggests limitations to this study and recommendations for future research.

Research Questions and Hypotheses

Research Question #1. What are the psychometric qualities of the survey used by SAC to assess individual and group effects of the Operations Branch reorganization?

Hypothesis 1.1. The reliability and validity of the survey will be sufficient to substantiate use of the survey.

Results. Although the correlation values of the survey questions were widely distributed from low to high, approximately 75 percent of the correlation values (r) were greater than 0.40 and approximately 75 percent of the correlation probability values (p) were less than 0.05. Typical results appear in Table III in Chapter IV. Question 154, a supervision question, was the only question which had negative correlation with other questions under the same variable. The results of the correlation analysis between question 154 and other supervision questions such as 42 ($r=-0.57$, $p=0.34$), 66 ($r=-0.13$, $p=0.18$), and 79 ($r=-0.004$,

p=0.49) are typical of the results attained when question 154 was correlated with the other supervision questions.

The reliability of all of the composite variables was also computed. The data in Table IV in Chapter IV depict the coefficient alpha value for each of the twenty-four composite variables used in this study. The reliability of these variables are within an acceptable range from 0.64 to 0.91. These results provide strong support for Hypothesis 1.1.

Recommendations. Question 154 should more properly be eliminated from the survey.

Research Question #2. What are the relationships between selected group related variables?

Hypothesis 2.1. There is a significant, negative correlation between group cohesion and group size.

Results. The correlation between group cohesion and group size ($r=-0.05$, $p=0.23$) indicates an insignificant, negative correlation between group cohesion and group size. These results lead to the rejection of Hypothesis 2.1.

Hypothesis 2.2. There is a significant, positive correlation between group cohesion and job satisfaction.

Results. The correlation between group cohesion and job satisfaction ($r=0.67$, $p=0.00$) indicates a significant, positive correlation between group cohesion and job satisfaction. These results provide strong support for Hypothesis 2.2.

Hypothesis 2.3. There is a significant, positive correlation between group cohesion and supervision.

Results. The correlation between group cohesion and supervision ($r=0.46$, $p=0.00$) indicates a significant, positive correlation between group cohesion and supervision. These results provide support for Hypothesis 2.3.

Hypothesis 2.4. There is a significant, positive correlation between group cohesion and job position tenure.

Results. The correlation between group cohesion and job position tenure ($r=-0.09$, $p=0.24$) indicates an insignificant, negative correlation between group cohesion and job position tenure. These results lead to the rejection of Hypothesis 2.4.

Hypothesis 2.5. There is a significant, positive correlation between group cohesion and group effectiveness.

Results. The correlation between group cohesion and group effectiveness ($r=0.62$, $p=0.00$) indicates a significant, positive correlation between group cohesion and group effectiveness. These results provide strong support for Hypothesis 2.5.

Hypothesis 2.6. There is relatively no correlation between group cohesion and roles.

Results. The correlation between group cohesion and roles ($r=0.71$, $p=0.00$) indicates a significant, positive correlation between group cohesion and roles. These results lead to the rejection of Hypothesis 2.6.

Hypothesis 2.7. There is a significant, positive correlation between group cohesion and communication.

Results. The correlation between group cohesion and communication ($r=0.76$, $p=0.00$) indicates a significant, positive correlation between group cohesion and communication. These results provide strong support for Hypothesis 2.7.

Recommendations. There appears to be a wide range of correlation between the composite variables. Research does indicate, however, that questions asked in part two of the survey seem to be more reliable than questions asked in the OCS part of the survey for the following composite variables: communication, contribution (role), and group cohesion (see Table V in Chapter IV). Since the questions in part two of the survey seem to be more reliable than the questions in part one of the survey, the questions from part one of the survey should be replaced by the corresponding questions from part two of the survey. This action would reduce the survey from 165 questions to 150 questions. The following questions should be removed: 2, 5, 15, 17, 29, 30, 34, 35, 45, 46, 47, 73, 78, and 83.

Research Question #3. Is the Jewell and Reitz group behavior model useful to model and measure group behavior that has been operationalized as group cohesion?

Hypothesis 3.1. The Jewell and Reitz group behavior model will account for a significant amount of variability in group cohesion.

Results. The use of the model in determining the effect of the independent variables: group size, job satisfaction, supervision, job position tenure, group effectiveness, roles and communication, on the dependent variable, group cohesion, appears to be successful. The F value of 19.81 at Base R and 30.46 at Base N are both significant, indicating that the R Square values of 0.76 and 0.66 are also significant. The R Square value of 0.76 at Base R and 0.66 at Base N indicates that approximately 76 and 66 percent, respectively, of the variability in group cohesion can be explained by variation in the seven independent variables tested. These results provide strong support for Hypothesis 3.1.

Recommendations. Continue the use of the group behavior model in the field for evaluation of group behavior relationships between other dependent and independent variables.

Research Question #4. What are the differences in job related attitudes between reorganized Operations Branch personnel and non-reorganized Operations Branch personnel?

Hypothesis 4.1. The job related attitude responses of the reorganized Operations Branch personnel are significantly higher than the job related attitude responses of the non-reorganized Operations Branch personnel.

Results. The results of the t-tests (see Table VIII in Chapter IV) indicate that except for

supervision, there are no significant differences in the mean responses between the reorganized Operations Branch and the non-reorganization Operations Branch. The t value of 2.34 with a probability value of 0.021 indicate that there is a significant difference between the perceived supervision of reorganized Operations Branch work groups and the perceived supervision of the non-reorganized Operations Branch work groups.

The supervision mean total frequency response values of 54.33 and 49.23 for Bases R and N, respectively, indicate that the perceived supervision of the reorganized Operations Branch work groups is significantly higher than the non-reorganized Operations Branch work groups. The results were significant for only one variable in Hypothesis 4.1, however, thus the hypothesis is rejected.

Recommendations. Conduct a longitudinal study to determine a trend in the job related attitudes of Operations Branch personnel. Include additional bases in the study.

Research Question #5. What are the differences in group characteristics between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups?

Hypothesis 5.1. The group cohesion of the reorganized Operations Branch work groups is significantly

higher than the group cohesion of the non-reorganized Operations Branch work groups.

Results. The result of the t-test (t=0.95, p=0.35) indicates that there are no significant differences in group cohesion between the reorganized Operations Branch work groups and the non-reorganized Operations Branch work groups. These results lead to the rejection of Hypothesis 5.1.

Hypothesis 5.2. There is no significant difference in roles between the reorganized Operations Branch work groups and the non-reorganized Operations Branch work groups.

Results. The result of the t-test (t=1.08, p=0.28) indicates that there are no significant differences in roles between the reorganized Operations Branch work groups and the non-reorganized Operations Branch work groups. This does not necessarily mean that the roles of the work groups at each base are the same, but that the group members at each base may have the same level of understanding of their role(s) regardless of the role(s). These results support Hypothesis 5.2.

Recommendations. Conduct a longitudinal study to determine a trend in the Operations Branch work group characteristics. Emphasis of the longitudinal study should be placed on group cohesion. Include additional bases in the study.

Research Question #6. What are the differences in the group processes between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups?

Hypothesis 6.1. The communication, responsibility, and independence levels are significantly higher in the reorganized Operations Branch work groups than in the non-reorganized Operations Branch work groups.

Results. The results of the t-tests indicate that there are no significant differences in communication ($t=1.06$, $p=0.29$), responsibility ($t=-0.92$, $p=0.36$), or independence ($t=0.60$, $p=0.55$) between the reorganized Operations Branch work groups and the non-reorganized Operations Branch work groups. These results lead to the rejection of Hypothesis 6.1.

Recommendations. Conduct a longitudinal study to determine a trend in the group processes of Operations Branch work groups. Include additional bases in the study.

Research Question #7. What are the differences in the perceived effectiveness between reorganized Operations Branch work groups and non-reorganized Operations Branch work groups.

Hypothesis 7.1. The perceived group effectiveness is significantly higher for the reorganized Operations Branch work groups than non-reorganized Operations Branch work groups.

Results. The measurement of perceived group effectiveness included the use of surrogate measures; organizational effectiveness and unit development. The results of the t-tests indicate that there are significant differences in perceived group effectiveness ($t=1.75$, $p=0.08$) and perceived organizational effectiveness ($t=2.01$, $p=0.05$) but no significant difference in unit development ($t=-0.73$, $p=0.47$) between the reorganized Operations Branch and the non-reorganized Operations Branch. The group effectiveness mean total frequency response values of 23.02 and 21.62 for Bases R and N, respectively, and the organizational effectiveness mean total frequency responses of 23.58 and 21.75 for Bases R and N, respectively, indicate that the perceived effectiveness of the reorganized Operations Branch work groups is significantly higher than the non-reorganized Operations Branch work groups. These results provide strong support for Hypothesis 7.1.

Recommendations. Obtain specific production measures (i.e., production reports, work order reports, etc.) to determine the actual effectiveness of the work groups. The hard measurement data can then be compared to the results obtained from the survey to determine if the perceptions of the group members reflect the actual effectiveness of the work groups.

Limitations

The research conducted for this thesis was limited to SAC Civil Engineering Operations Branches. While this limitation will restrict generalization of the results to SAC Civil Engineering squadrons, similar results can be expected from non-SAC Civil Engineering squadrons. Squadrons with a mission or structure similar to Civil Engineering can also use the results since the data collection instrument was designed to gather information independent of command or squadron affiliation.

The results of this research project is also limited in the amount of time for which the results are valid since the study was cross-sectional rather than longitudinal. A cross-sectional study precludes the development of a longitudinal paradigm from the conclusions made in the study.

Another limitation to this research project was the lack of specific production measures to which the survey results could be compared. Use of specific production measures would have allowed for validation of the results and conclusions drawn from the survey data.

Future Research

The original objective of this thesis research project was to observe changes in a Civil Engineering Operations Branch as it underwent a reorganization of its work groups. Due to circumstances beyond the control of this researcher,

the final results of this project represent a "snapshot" view of the reorganized and non-reorganized Operations Branches, which were observed and compared.

This single measurement, while useful alone, can certainly be improved on in future research. By using the validated survey designed for this study, the Jewell and Reitz group behavior model, and the group behavior variables studied in this project, additional research could be conducted to determine the success of the Operations Branch reorganization.

Future research should include additional bases, collection of specific production measures, and the administration of the survey at least twice during the research period.

Summary

This research was conducted in the areas of: survey instrument validation, group behavior model evaluation, individual attitude analysis, and group behavior analysis. Although few significant results were discovered in the areas of individual attitudes and group behavior, the results that were obtained appear to coincide with the literature reviewed in Chapter II.

This study did establish a foundation on which an accurate assessment of change in organizational processes can be made. The validation of the survey instrument and

Jewell and Reitz group behavior model provides that foundation.

Appendix A: Survey Part I

SCN 86-105

GENERAL INSTRUCTIONS

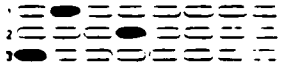
1. THIS SURVEY IS STRICTLY ANONYMOUS. Do not write your name or SSAN on either your answer sheet or survey booklet. Participation is entirely voluntary; no adverse action of any kind will be taken against you if you choose not to complete the survey. In addition, your answers will be analyzed only as part of a group and your individual responses will not be examined or published in any way.

2. All statements may be answered by filling in appropriate spaces on the answer sheet. If you do not find the exact answer that reflects your opinion, use the one that is closest to it. Do not answer in the survey booklet; use the separate answer sheet.

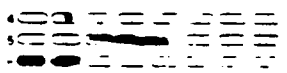
3. The answer sheet is designed for machine scanning of your responses. Please use a Number 2 pencil and observe the following requirements:

- Make heavy black marks that fill the spaces.
- Erase cleanly any answer you wish to change.
- Make no stray markings of any kind on the answer sheet.
- Do not staple, tear or fold the answer sheet.

RIGHT WAY TO MARK ANSWER SHEET



WRONG WAY TO MARK ANSWER SHEET



4. Below is a list of key words and their definitions as they are used in this survey:

UNIT/ORGANIZATION: your Squadron/Division

SUPERVISOR/BOSS: the person to whom you report directly (the reporting official on your performance report)

WORK GROUP: all those persons who report to the same supervisor as you do

MANAGEMENT: levels of management from Squadron/Division through Wing/Center

CIVILIAN SERVICE: all appropriated and nonappropriated civilian employees

SECTION I

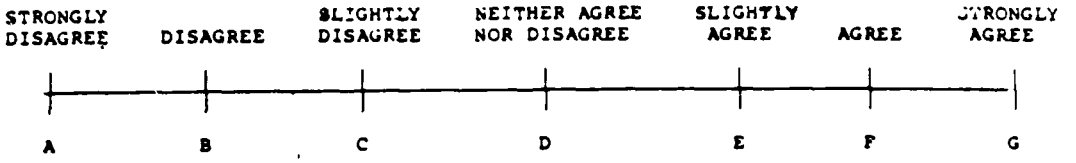
Following are a series of statements about your job. Using the scale below, you are to indicate how much you agree or disagree with each statement.

STRONGLY DISAGREE	DISAGREE	SLIGHTLY DISAGREE	NEITHER AGREE NOR DISAGREE	SLIGHTLY AGREE	AGREE	STRONGLY AGREE
A	B	C	E	E	F	G

Mark A in the answer sheet if you STRONGLY DISAGREE
Mark B in the answer sheet if you DISAGREE
Mark C in the answer sheet if you SLIGHTLY DISAGREE
Mark D in the answer sheet if you NEITHER AGREE NOR DISAGREE
Mark E in the answer sheet if you SLIGHTLY AGREE
Mark F in the answer sheet if you AGREE
Mark G in the answer sheet if you STRONGLY AGREE

The scale above will be at the top of each page in this section. Please respond to every statement. While some of the statements may appear similar to each other, no two statements are identical. Please do not go back to previous statements. Try to give as accurate a picture as possible of your feelings and opinions about all aspects of your unit.

1. My supervisor sets an example by working hard.
2. Information is usually widely shared in my unit so that those who make the decisions will base their decisions on the best available know-how.
3. In looking back, it is difficult to point to my accomplishments on the job.
4. If feel I am doing something important by serving as a member of the Air Force team.
5. I have confidence and trust in the persons in my work group.
6. The opportunity to take on new responsbilities is available if I want it.
7. I feel my career provides sufficient economic security.
8. The recreational opportunities in this geographic area are satisfactory.
9. In general, I am more satisfied with my unit as compared to other units to which I've been assigned.
10. I have a good chance for promotion.
11. For most situations, I have confidence and trust in my unit management.
12. For the most part, my working hours are not excessive.
13. Management recognizes my ability.
14. My supervisor tries to strike a balance between people needs and production needs.
15. I would say that the lowest level supervisors in my organization usually have enough say or influence about what goes on.
16. Most of the time I get a feeling of achievement from my job.



17. Persons in my work group are friendly and easy to approach.

18. In general, I decide for myself how to accomplish a job.

19. I do not look forward to coming to work each day.

20. The people in my unit seem to get maximum output from the resources (money, people, equipment, etc.) they have available.

21. My job provides an opportunity for career broadening.

22. In my job I utilize my civilian/military education and training.

23. Most of the time my supervisor will not back me up.

24. All things considered, I am satisfied with living in this geographic area.

25. Most of the time my military/civilian service pay is adequate to cover the basic expenses with a little left over.

26. I do not believe my job contributes a lot to the success of my unit's mission.

27. In my job I have the chance to feel I am accomplishing something.

28. I am often given responsibility for a total project.

29. My immediate supervisor usually tells me what's going on at higher levels of management.

30. In my unit, employees who do not supervise others have an adequate amount of say or influence on what goes on.

31. Management shows respect for me as a person.

32. Most of the time the right decisions are made a upper levels of supervision.

33. Opportunity for promotions in my career field/job series is fair and equitable.

34. For the most part, I have no impact on work objectives. They are announced with no opportunity to participate or contribute.

35. The people in my unit work together effectively as a team.

36. I feel very little loyalty toward my unit.

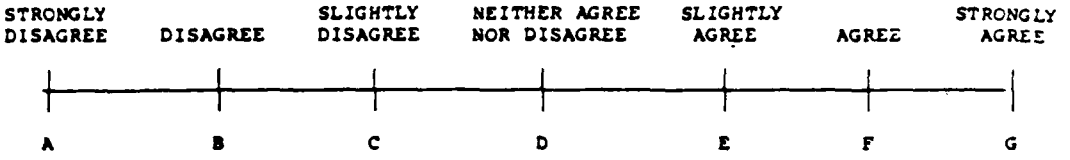
37. Management in my unit is capable of operating effectively under stress.

38. When I do a good job I can expect praise from my supervisor.

39. My job is boring.

40. I have a say in setting my work goals.

41. The quality of work produced by the people in my unit is not too good.



42. My supervisor handles the technical side of his/her job well - for example, general expertness, knowledge of job, technical skills needed in his/her profession or trade.

43. There is not much similarity between my abilities and the requirements of my job.

44. The people in my work unit believe that they are doing something important for the country by working in the Air Force.

45. Our work unit receives little information about what is going on in other sections or branches.

46. In my job I make a meaningful contribution to the organization.

47. Persons in my work group know what their jobs are and know how to do them well.

48. Management cares what happens to me.

49. I usually don't get the chance to handle the tough and highly visible projects.

50. I feel a real responsibility to help the organization be successful.

51. My military/civilian servie income provides me with an acceptable standard of living.

52. My present job assignment offers the opportunity for future advancement.

53. Upper levels of management do not understand the problems I face in doing my job.

54. In general, my work schedule is flexible enough so that I can make personal plans.

55. My supervisor has poor leadership qualities.

56. Most of the time my unit meets mission requirements.

57. Very little responsibility goes with my job.

58. My work assignment is challenging.

59. Rarely do my efforts lead to positive results.

60. I enjoy my job.

61. I dislike the geographic area to which I am assigned.

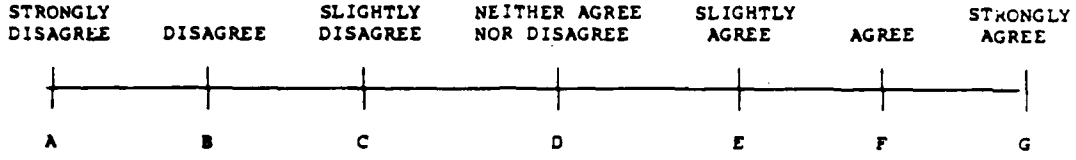
62. I feel I have the chance to "grow" in my job.

63. My unit usually recognizes good performance.

64. Rarely am I given the opportunity to make decisions for myself.

65. I am proud to be a member of the Air Force team.

66. My supervisor is not effective in handling personnel problems.



67. I see the Air Force as a way of life and not simply a place to work.

68. Promotions are usually based on performance and ability.

69. My unit is not sensitive to the problems of the individual.

70. My job gives me the chance to "dig deeper" into work activities which interest me.

71. My supervisor is well qualified for his/her job.

72. Working conditions are usually below average.

73. Morale in my organization is good.

74. My present assignment does not give me the chance to do the kind of work I do best.

75. My job provides no new challenges.

76. I generally decide the work methods and procedures for my job.

77. There is a very limited opportunity for personal growth and development in my job.

78. Our work unit is usually aware of important events and situations.

79. My supervisor is not a capable individual.

80. Most of the people of this local area have a positive attitude toward Air Force employees.

81. The Air Force usually tries to take care of its own.

82. The people in my unit do a poor job in anticipating problems that may come up in the future and preventing them from occurring.

83. When decisions are being made in my unit, the persons who will be affected most are asked for their ideas.

84. Working conditions associated with my job are acceptable.

85. I feel secure that I will be able to make ends meet on my military/civilian service pay.

86. I get to do a lot of interesting work in my present job.

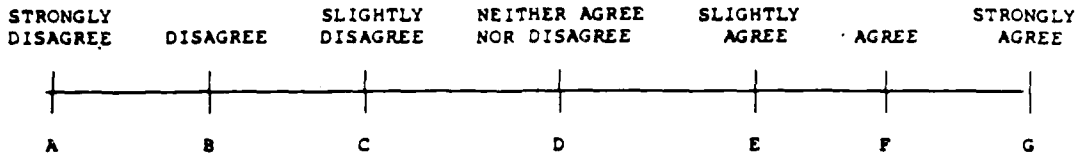
87. I am usually given the opportunity to present the results of my work to others.

88. I have confidence and trust in my supervisor.

89. Promotion policy is unfair.

90. In general, most of my skills and abilities are being used in my present job.

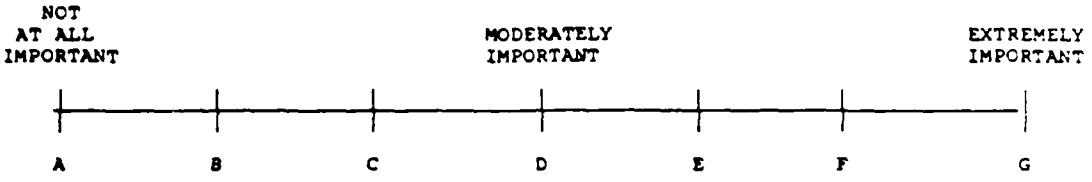
91. My job does not give me much opportunity for recognition.



92. In general, when emergencies arise, such as short suspenses, crash programs, and schedule changes, the people in my unit do a poor job in handling these situations.

93. I am satisfied with the number and types of social activities in the surrounding area.

SECTION II



Listed below in items 94-113 are a number of factors and their descriptions which are often used to describe organizational well being.

Using the scale above, please indicate the amount of importance you personally place on each of these factors. Mark the appropriate letter of the scale next to the appropriate number on the answer sheet. For example, if you feel that ACHIEVEMENT is between not important and moderately important, then darken either the B or C oval next to number 94 on the answer sheet. If, however, you feel ACHIEVEMENT is extremely importan, then you would makr G on the answer sheet. Indicate only how important each factor is to you, not how satisfied you currently are with each factor in your organization.

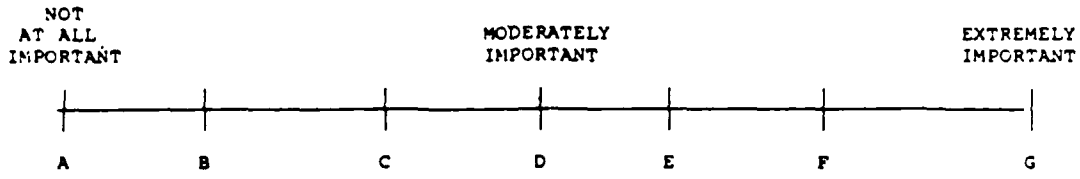
94. ACHIEVEMENT - Feelings of accomplishment derived from job performance. The pride and pleasure associated with a job well done.

95. ASSIGNMENT LOCALITY - The desirability of the current assignment locality. Includes characteristics of the base as well as characteristics of the surrounding community.

96. COMMITMENT - A feel or belief that the Air Force mission is important to our country. Dedication to the mission. Acceptance of the Air Force as a way of life. Purpose for belonging to the Air Force goes beyond monetary reward.

97. COMMUNICATION - Adequacy of communication structure. Free flow of dialogue up, down and across organizational structure. Well defined feedback loops.

98. CONCERN FOR INDIVIDUAL - Belief that management cares about the welfare of each person. The person is not treated as just another worker but as a unique individual.



99. CONFIDENCE IN MANAGEMENT - Belief that leaders make the right decisions most of the time. Management is heading in the right direction.

100. CONTRIBUTION/PARTICIPATION - The feeling that the individual's work is valuable to the Air Force. The individual has an impact on the mission. The individual is a part of the decision and management processes, and assists in establishing the goals of the organization.

101. GROUP COHESION/WORKER RELATIONS - The compatibility of workers. Includes characteristics of coworkers such as how friendly, cooperative, competent, and sociable they are.

102. IDENTIFICATION - Individual considers himself/herself as a member of a special group. The individual is not only a worker but also a part of the Air Force and unit.

103. INDEPENDENCE - The chance for the individual to plan and carry out work activities rather than be directed by others. The chance to work with minimal supervision, and to have some independence in planning and implementing work.

104. INTEREST - The chance to perform work activities which are consistent with personal preferences or interests. The chance to do work which is pleasurable.

105. ORGANIZATIONAL EFFECTIVENESS - The quality and quantity of work is consistent with the capabilities of the organizational personnel. Productivity is at the highest level; people are doing the best they can.

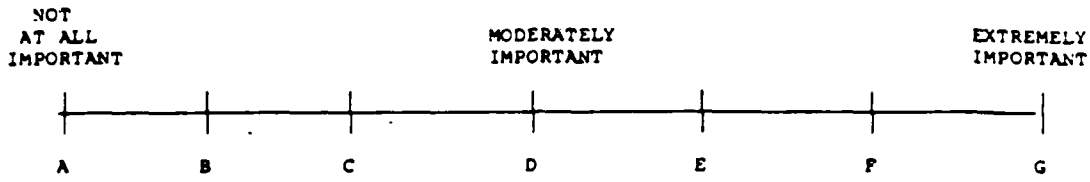
106. PAY AND BENEFITS/ECONOMIC SECURITY - The level of pay and the desirability of military/civilian service benefits. Included (as applicable) are incentive pay, retirement, medical care or insurance, BX, commissary, etc. Feeling that the job is secure even if economic situation changes. The feeling that basic needs will be met.

107. PERSONAL GROWTH AND DEVELOPMENT - The opportunity for self-fulfillment in the job. The chance to "grow" in the job, by developing new interests and skills.

108. PROMOTION OPPORTUNITY - The operation of the military/civilian service promotion system. Includes opportunity for promotion, the criteria for promotion, etc.

109. RECOGNITION - The opportunity to obtain clear recognition or appreciation for work activities. This acknowledgement may come from sources inside the Air Force (such as supervisor, unit commander, etc.) or outside the Air Force (community, family, etc.). Included is recognition based on the work performed rather than the position occupied.

110. RESPONSIBILITY - The amount of responsibility for your actions, decisions, and their consequences. Includes responsibility for the welfare of people, for accomplishment of a mission, for tools or equipment and other property, or for financial assets.



111. SUPERVISION - The ability of the boss or supervisor to handle human or social situations on the job. The amount of concern displayed by supervisor for the welfare of his/her people. The competence displayed by supervisor dealing with technical problems encountered in the job. Supervisor's ability to develop technical skills in his/her people.

112. UTILIZATION - The extent to which the job makes use of individual abilities, training, and expertise.

113. WORKING CONDITIONS - Characteristics of immediate work area, such as lighting, noise level, cleanliness, work space, etc. Also included are characteristics such as duty hours and time off.

SECTION III

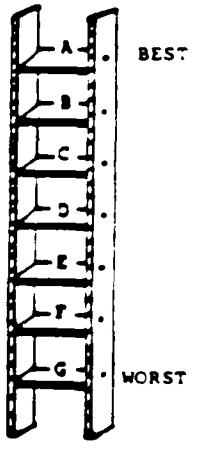
Refer to the ladder illustrated below. Regarding your working environment (including the nature of the job, worker relations, etc.), suppose that the top of the ladder (step A) represents the best possible work life and the bottom (step G) the worst possible work life.

114. Where on the ladder do you feel you stand at the present time? Select the letter that corresponds to your answer.

115. Where on the ladder would you say you stood one year ago?

116. Where do you think you will be on the ladder one year from now?

Looking at the ladder again, suppose the best possible unit is at the top and worst possible unit at the bottom.



117. Where would you put your unit on the ladder at the present time?

118. Where do you think your unit stood one year ago? If you feel you have not been in your unit long enough to give a good evaluation, mark response "H" on the answer sheet for Item 118.

119. Just as your best guess, where do you think your unit will be on the ladder one year from now?

SECTION IV

For the following questions choose the response that best reflects your feelings about your job. Darken the letter that most accurately reflects your feelings.

120. WHICH ONE OF THE FOLLOWING SHOWS HOW MUCH OF THE TIME YOU FEEL SATISFIED WITH YOUR JOB?

A. All the time
B. Most of the time
C. A good deal of the time
D. About half of the time
E. Occasionally
F. Seldom
G. Never

121. CHOOSE THE ONE OF THE FOLLOWING STATEMENTS WHICH BEST TELLS HOW WELL YOU LIKE YOUR JOB.

A. I hate it
B. I dislike it
C. I don't like it
D. I am indifferent to it
E. I like it
F. I am enthusiastic about it
G. I love it

122. WHICH ONE OF THE FOLLOWING BEST TELLS HOW YOU FEEL ABOUT CHANGING YOUR JOB?

A. I would quit this job at once if I could
B. I would take almost any other job in which I could earn as much as I am earning now
C. I would like to change both my job and my occupation
D. I would like to exchange my present job for another one
E. I am not eager to change my job, but I would do so if I could get a better job
F. I cannot think of any jobs for which I would exchange
G. I would not exchange my job for any other

123. WHICH ONE OF THE FOLLOWING SHOWS HOW YOU THINK YOU COMPARE WITH OTHER PEOPLE?

A. No one likes his job better than I like mine
B. I like my job much better than most people like theirs
C. I like my job better than most people like theirs
D. I like my job about as well as most people like theirs
E. I dislike my job more than most people dislike theirs
F. I dislike my job much more than most people dislike theirs
G. No one dislikes his job more than I dislike mine

124. To which group do you belong?

A. Second Lieutenant - Captain
B. Major - Colonel
C. Airman Basic - Senior Airman
D. Sergeant - Technical Sergeant
E. Master Sergeant - Chief Master Sergeant
F. GS/GM 12-15, WS 14-19, WL-15, UA-12
G. GS 7-11, WS 8-13, WL 6-14, WG 12-15, WP 17-18, UA 7-11
H. GS 5-6, WS 1-7, WL 1-5, WG 9-11, WP 11-16, UA 5-6
I. GS 1-4, WG 1-8, WP 4-10, UA 1-4, all AS, NA, NL

125. Are you a supervisor in your present job?

A. Yes
B. No

SECTION V

If you are a civilian employee, omit items 126, 127 and 128.

126. What is your sex?

A. Male
B. Female

127. What is your racial or ethnic background?

A. American Indian
B. Black, Black American, Afro American
C. Caucasian/White (Other than Spanish speaking)
D. Oriental/Oriental American (Asian American, Chinese, Filipino, Japanese, Korean
E. Spanish speaking origin (Chicano, Cuban, Latin American, Mexican American, Puerto Rican)
F. Other

128. What is your aeronautical rating?

A. Not applicable
B. Support Officer
C. Pilot
D. Navigator
E. Missileer

SECTION VI

SAC CE TEST

129. In which Civil Engineering branch do you work?

A. Operations
B. Engineering and Environment Planning
C. Fire Department
D. Other

130. Where are you stationed?

A. Pease AFB
B. Loring AB
C. Malmstrom AFB
D. Dyess AFB
E. [illegible] AFB

Appendix B: Survey Part II

CONTINUATION OF ORGANIZATIONAL CLIMATE SURVEY

For the following questions, you are going to be asked for your opinion concerning various aspects of your work group. WORK GROUP is defined as all persons who report to the same supervisor as you do.

For the following questions, choose the response that best reflects the correct answer and mark it on the answer sheet that you have been using.

131. How long have you been in your present job position?

(A) less than 3 months
(B) 3 months but less than 6 months
(C) 6 months but less than 1 year
(D) 1 year but less than 2 years
(E) 2 years but less than 3 years
(F) 3 years or more

132. What is the size of your work group?

(A) less than 5 personnel
(B) 6-10 personnel
(C) 11-15 personnel
(D) 16-20 personnel
(E) 21-25 personnel
(F) 26-35 personnel
(G) more than 35 personnel

Following are a series of statements about your work group. Use the scale below to indicate how much you agree or disagree with each statement. Continue using the same answer sheet.

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F

133. I feel a responsibility towards my work group.

134. My work group always gets maximum output from available resources (e.g., personnel and material).

135. People in my work group are never afraid to speak their minds about issues and problems that affect them.

136. I can not wait until I get moved to another work group in this squadron.

137. The communication between my supervisor and myself is good.

138. I often have the chance to do things my own way.

139. I feel I am really part of my work group.

140. My direct supervisor seeks the advice of our work group on important matters before going ahead with a decision.

141. I would describe the atmosphere in my work group as friendly and relaxed.

142. Within my work group, the people most affected by decisions frequently participate in making those decisions.

143. The QUANTITY of output of my work group is very high.

144. My co-workers do not know how to treat people.

145. All in all, I like the people in my work group.

146. Members of my work group freely communicate with one another.

147. My work group is allowed significant degree of influence in decisions regarding the way we do our job.

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F

148. If I had the chance to do the same kind of work for the same pay in another work group, I would still stay here in this work group.

149. There are clear channels of communication in my work group.

150. Most work groups in the squadron get along better than my work group.

151. I can expect that suggestions I make will be heard and seriously considered.

152. Overall, I am satisfied with my job.

153. I feel accepted by the members of my work group.

154. My direct supervisor insists that members of our work group follow, to the letter, all policies and procedures that are handed down.

155. Each day I look forward to being with the members of my work group.

156. My supervisor provides all the necessary information for me to do my job effectively.

157. There is a high spirit of teamwork among my co-workers.

158. I am allowed a significant degree of influence in decisions regarding the way I do my job.

159. My direct supervisor usually asks for my opinions and thoughts in decisions affecting my work.

160. My direct supervisor makes an effort to help people in the work group with their personal problems.

161. The QUALITY of output of my work group is very high.

162. I feel I am strongly committed to my work group.

163. My work group's performance, in comparison to similar work groups, is very high.

164. Members of my work group take a personal interest in one another.

Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
A	B	C	D	E	F

165. When high priority work arises, such as short suspenses or schedule changes, the people in my work group do an OUTSTANDING job in handling these situations.

Your participation in this survey is greatly appreciated. Your answers will be kept confidential. Thank you.

Now, please return both questionnaires and the answer sheet to the individual that gave them to you.

Appendix C: Survey Questions - Variable Categories

Variable	Question
Achievement	3, 16, 27, 59
Assignment Locality	8, 24, 61, 80, 93
Commitment	4, 44, 65, 67, 81
Communication	2, 29, 45, 78, 83, 135, 137, 146, 149, 151, 156
Concern for Individual	13, 31, 48, 69
Confidence in Mgt	11, 32, 37, 53
Contribution (Roles)	15, 26, 30, 34, 46, 138, 140, 142, 147, 158, 159
Group Cohesion	5, 17, 35, 47, 73, 133, 136, 139, 141, 144, 145, 148, 150, 153, 155, 157, 162, 164
Group Effectiveness	134, 143, 161, 163, 165
Identification	9, 36, 50
Independence	18, 40, 64, 76
Interest	19, 39, 60, 70, 86
Job Position Tenure	131
Job Satisfaction	120, 121, 122, 123, 152
Org Effectiveness	20, 41, 56, 82, 92
Pay, Benefits	7, 25, 51, 85
Personal Development	21, 52, 62, 75, 77
Promotion Opportunity	10, 33, 68, 89
Recognition	38, 63, 87, 91
Responsibility	6, 28, 49, 57

Variable	Question
Size	132
Supervision	1, 14, 23, 42, 55, 66, 71, 79, 88, 154, 160
Unit Development	117, 118, 119
Utilization	22, 43, 58, 74, 90
Working Conditions	12, 54, 72, 84
Work Life	114, 115, 116

Appendix D: SPSS* Computer Program

```
TITLE           'Thesis Research Data Analysis Program'
FILE HANDLE     THESDATA/ NAME='comb.dat'
DATA LIST       FILE=THESDATA FIXED RECORDS=3/
 super1,comm1,ach1,cmt1,gpcoh1,res1,perk1,asgn1,id1,promo1,
 mgtcon1,wcon1,incon1,super2,role1,ach2,gpcoh2,indp1,int1,
 orgeff1,dev1,ut1,super3,asgn2,perk2,role2,ach3,res2,comm2,
 role3,incon2,mgtcon2,promo2,role4,gpcoh3,id2,mgtcon3,rec1,
 int2,indp2,orgeff2,super4,ut2,cmt2,comm3,role5,gpcoh4,incon3,
 res3,id3,perk3,dev2,mgtcon4,wcon2,super5,orgeff3,res4,ut3,ach4,
 int3,asgn3,dev3,rec2,indp3,cmt3,super6,cmt4,promo3,incon4,int4,
 super7,wcon3,gpcoh5,ut4,dev4,indp4,dev5,comm4,super8,asgn4,cmt5,
 orgeff4,comm5,wcon4,perk4,int5,rec3,super9,promo4,ut5,rec4,orgeff5,
 asgn5,imach,imasgn,imcmt,imcomm,imincon,immgtcon,imrole,imgpcoh,
 imid,imindp,imint,imorgeff,imperk,imdev,impromo,imrec,imres,imsuper,
 imut,imwcon,wlife1,wlife2,wlife3,unit1,unit2,unit3,jobsat1,jobsat2,
 jobsat3,jobsat4,rank,boss,sex,race,rating,branch,base,xjobpos,xsize,
 xgpcoh1,xgrpeff1,xcomm1,xgpcoh2,xcomm2,xrole1,xgpcoh3,xrole2,xgpcoh4,
 xrole3,xgrpeff2,xgpcoh5,xgpcoh6,xcomm3,xrole4,xgpcoh7,xcomm4,xgpcoh8,
 xcomm5,xjobsat1,xgpcoh9,xsuper1,xgpcoh10,xcomm6,xgpcoh11,xrole5,xrole6,
 xsuper2,xgrpeff3,xgpcoh12,xgrpeff4,xgpcoh13,xgrpeff5
  (72F1.0/67F1.0/26F1.0)
COMMENT         ****************************************************************
COMMENT         Recode reverse coded questions.
COMMENT         ****************************************************************
RECODE          ach1,int1,super3,role2,role4,id2,int2,orgeff2,ut2,comm3,res3,
  mgtcon4,super5,res4,ach4,asgn3,indp3,super6,incon4,wcon3,ut4,
  dev4,dev5,super8,orgeff4,promo4,rec4,orgeff5,wlife1,wlife2,
  wlife3,unit1,unit2,unit3,jobsat1,jobsat4 (1=7) (2=6) (3=5)
   (4=4) (5=3) (6=2) (7=1)/
  xgpcoh2,xgpcoh5,xgpcoh8,xsuper1 (1=6) (2=5) (3=4) (4=3)
   (5=2) (6=1)
COMMENT         ****************************************************************
COMMENT         Recode missing values.
COMMENT         ****************************************************************
RECODE          promo1,promo2,mgtcon4,comm5,rec4,xcomm5,xsuper1 (MISSING=3)/
  perk1,id1,int1,perk2,incon2,role4,mgtcon3,rec1,cmt2,dev2,rec2,incon4,
  ut4,perk4,int5,wlife1,jobsat3,xgrpeff1,xcomm1,xgpcoh2,xcomm2,xrole1,
  xgpcoh3,xrole2,xgpcoh4,xrole3,xgrpeff2,xgpcoh5,xrole4,xgpcoh7,xcomm4,
  xgpcoh8,xjobsat1,xgpcoh10,xcomm6,xgpcoh11,xrole5,xrole6,xsuper2,xgrpeff3,
  xgpcoh12,xgrpeff4,xgpcoh13 (MISSING=4)/
  super1,cmt1,gpcoh1,id2,role5,comm4,wlife2,wlife3,unit2,xgpcoh1,xgpcoh6,
  xcomm3,xgpcoh9,xgrpeff5 (MISSING=5)/
  immgtcon (MISSING=6)/
COMMENT         ****************************************************************
COMMENT         Compute composite variables (total survey).
COMMENT         ****************************************************************
COMPUTE         ach=(ach1+ach2+ach3+ach4)
COMPUTE         asgn=(asgn1+asgn2+asgn3+asgn4+asgn5)
COMPUTE         cmt=(cmt1+cmt2+cmt3+cmt4+cmt5)
COMPUTE         comm=(comm1+comm2+comm3+comm4+comm5+xcomm1+xcomm2+xcomm3+
                      xcomm4+xcomm5+xcomm6)
COMPUTE         incon=(incon1+incon2+incon3+incon4)
COMPUTE         mgtcon=(mgtcon1+mgtcon2+mgtcon3+mgtcon4)
COMPUTE         role=(role1+role2+role3+role4+role5+xrole1+xrole2+xrole3+
                      xrole4+xrole5+xrole6)
COMPUTE         gpcoh=(gpcoh1+gpcoh2+gpcoh3+gpcoh4+gpcoh5+xgpcoh1+xgpcoh2+
                       xgpcoh3+xgpcoh4+xgpcoh5+xgpcoh6+xgpcoh7+xgpcoh8+
                       xgpcoh9+xgpcoh10+xgpcoh11+xgpcoh12+xgpcoh13)
COMPUTE         id=(id1+id2+id3)
COMPUTE         indp=(indp1+indp2+indp3+indp4)
COMPUTE         int=(int1+int2+int3+int4+int5)
COMPUTE         orgeff=(orgeff1+orgeff2+orgeff3+orgeff4+orgeff5)
COMPUTE         perk=(perk1+perk2+perk3+perk4)
COMPUTE         dev=(dev1+dev2+dev3+dev4+dev5)
COMPUTE         promo=(promo1+promo2+promo3+promo4)
COMPUTE         rec=(rec1+rec2+rec3+rec4)
```

```
COMPUTE         res=(res1+res2+res3+res4)
COMPUTE         super=(super1+super2+super3+super4+super5+super6+super7+super8+
                      super9+xsuper1+xsuper2)
COMPUTE         ut=(ut1+ut2+ut3+ut4+ut5)
COMPUTE         wcon=(wcon1+wcon2+wcon3+wcon4)
COMPUTE         wlife=(wlife1+wlife2+wlife3)
COMPUTE         unit=(unit1+unit2+unit3)
COMPUTE         jobsat=(jobsat1+jobsat2+jobsat3+jobsat4+xjobsat1)
COMPUTE         grpeff=(xgrpeff1+xgrpeff2+xgrpeff3+xgrpeff4+xgrpeff5)
COMMENT         ************************************************************.
COMMENT         Compute composite variables (my questions).
COMMENT         ************************************************************.
COMPUTE         xcomm=(xcomm1+xcomm2+xcomm3+xcomm4+xcomm5+xcomm6)
COMPUTE         xrole=(xrole1+xrole2+xrole3+xrole4+xrole5+xrole6)
COMPUTE         xgpcoh=(xgpcoh1+xgpcoh2+xgpcoh3+xgpcoh4+xgpcoh5+xgpcoh6+
                        xgpcoh7+xgpcoh8+xgpcoh9+xgpcoh10+xgpcoh11+xgpcoh12+
                        xgpcoh13)
COMPUTE         xsuper=(xsuper1+xsuper2)
COMPUTE         xjobsat=xjobsat1
COMPUTE         xgrpeff=grpeff
COMMENT         ************************************************************.
COMMENT         Compute composite variables (OCS questions).
COMMENT         ************************************************************.
COMPUTE         oach=ach
COMPUTE         oasgn=asgn
COMPUTE         ocmt=cmt
COMPUTE         ocomm=(comm-xcomm)
COMPUTE         oincon=incon
COMPUTE         omgtcon=mgtcon
COMPUTE         orole=(role-xrole)
COMPUTE         ogpcoh=(gpcoh-xgpcoh)
COMPUTE         oid=id
COMPUTE         oindp=indp
COMPUTE         oint=int
COMPUTE         oorgeff=orgeff
COMPUTE         operk=perk
COMPUTE         odev=dev
COMPUTE         opromo=promo
COMPUTE         orec=rec
COMPUTE         ores=res
COMPUTE         osuper=(super-xsuper)
COMPUTE         out=ut
COMPUTE         owcon=wcon
COMPUTE         owlife=wlife
COMPUTE         ounit=unit
COMPUTE         ojobsat=(jobsat-xjobsat)
COMMENT         ************************************************************.
COMMENT         Perform reliability analysis.
COMMENT         ************************************************************.
RELIABILITY     VARIABLES=ach1,ach2,ach3,ach4/
                SCALE(ach)=ach1 TO ach4/
                VARIABLES=asgn1,asgn2,asgn3,asgn4,asgn5/
                SCALE(asgn)=asgn1 TO asgn5/
                VARIABLES=cmt1,cmt2,cmt3,cmt4,cmt5/
                SCALE(cmt)=cmt1 TO cmt5/
                VARIABLES=comm1,comm2,comm3,comm4,comm5/
                SCALE(comm)=comm1 TO comm5/
                VARIABLES=xcomm1,xcomm2,xcomm3,xcomm4,xcomm5,xcomm6/
                SCALE(xcomm)=xcomm1 TO xcomm6/
                VARIABLES=incon1,incon2,incon3,incon4/
                SCALE(incon)=incon1 TO incon4/
                VARIABLES=mgtcon1,mgtcon2,mgtcon3,mgtcon4/
                SCALE(mgtcon)=mgtcon1 TO mgtcon4/
                VARIABLES=role1,role2,role3,role4,role5/
                SCALE(role)=role1 TO role5/
                VARIABLES=xrole1,xrole2,xrole3,xrole4,xrole5,xrole6/
```

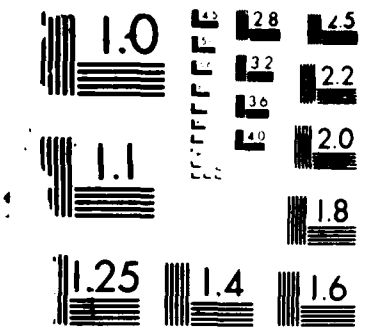
```
                SCALE(xrole)=xrole1 TO xrole6/
                VARIABLES=gpcoh1,gpcoh2,gpcoh3,gpcoh4,gpcoh5/
                SCALE(gpcoh)=gpcoh1 TO gpcoh5/
STATISTICS 1 2 3 4 8 9
RELIABILITY     VARIABLES=xgpcoh1,xgpcoh2,xgpcoh3,xgpcoh4,xgpcoh5,xgpcoh6,
                          xgpcoh7,xgpcoh8,xgpcoh9,xgpcoh10,xgpcoh11,
                          xgpcoh12,xgpcoh13/
                SCALE(xgpcoh)=xgpcoh1 TO xgpcoh13/
                VARIABLES=id1,id2,id3/
                SCALE(id)=id1 TO id3/
                VARIABLES=indp1,indp2,indp3,indp4/
                SCALE(indp)=indp1 TO indp4/
                VARIABLES=int1,int2,int3,int4,int5/
                SCALE(int)=int1 TO int5/
                VARIABLES=orgeff1,orgeff2,orgeff3,orgeff4,orgeff5/
                SCALE(orgeff)=orgeff1 TO orgeff5/
                VARIABLES=perk1,perk2,perk3,perk4/
                SCALE(perk)=perk1 TO perk4/
                VARIABLES=dev1,dev2,dev3,dev4,dev5/
                SCALE(dev)=dev1 TO dev5/
                VARIABLES=promo1,promo2,promo3,promo4/
                SCALE(promo)=promo1 TO promo4/
                VARIABLES=rec1,rec2,rec3,rec4/
                SCALE(rec)=rec1 TO rec4/
                VARIABLES=res1,res2,res3,res4/
                SCALE(res)=res1 TO res4/
STATISTICS 1 2 3 4 8 9
RELIABILITY     VARIABLES=super1,super2,super3,super4,super5,super6,super7,
                          super8,super9/
                SCALE(super)=super1 TO super9/
                VARIABLES=xsuper1,xsuper2/
                SCALE(xsuper)=xsuper1 TO xsuper2/
                VARIABLES=ut1,ut2,ut3,ut4,ut5/
                SCALE(ut)=ut1 TO ut5/
                VARIABLES=wcon1,wcon2,wcon3,wcon4/
                SCALE(wcon)=wcon1 TO wcon4/
                VARIABLES=wlife1,wlife2,wlife3/
                SCALE(wlife)=wlife1 TO wlife3/
                VARIABLES=unit1,unit2,unit3/
                SCALE(unit)=unit1 TO unit3/
                VARIABLES=jobsat1,jobsat2,jobsat3,jobsat4,xjobsat1/
                SCALE(jobsat)=jobsat1 TO xjobsat1/
                VARIABLES=xgrpeff1,xgrpeff2,xgrpeff3,xgrpeff4,xgrpeff5/
                SCALE(xgrpeff)=xgrpeff1 TO xgrpeff5/
STATISTICS 1 2 3 4 8 9
COMMENT         **********************************************************
COMMENT         Perform t-test.
COMMENT         **********************************************************
T-TEST          GROUPS=base(2,5)/VARIABLES=ach,asgn,cmt,comm,incon,mgtcon,
  role,gpcoh,id,indp,int,orgeff,perk,dev,promo,rec,res,super,
  ut,wcon,wlife,unit,jobsat,grpeff/
T-TEST          GROUPS=base(2,5)/VARIABLES=xcomm,xrole,xgpcoh,xsuper,
  xjobsat,xgrpeff,xsize/
T-TEST          GROUPS=base(2,5)/VARIABLES=oach,oasgn,ocmt,ocomm,oincon,
  omgtcon,orole,ogpcoh,oid,oindp,oint,oorgeff,operk,odev,opromo,orec,ores,
  osuper,out,owcon,owlife,ounit,ojobsat/
COMMENT         **********************************************************
COMMENT         Perform regression analysis.
COMMENT         **********************************************************
REGRESSION      VARS=xcomm,xrole,xgpcoh,xsuper,xjobsat,xgrpeff,xjobpos,
  xsize/DEP=xgrpeff/ENTER
REGRESSION      VARS=xcomm,xrole,xgpcoh,xsuper,xjobsat,xgrpeff,xjobpos,
  xsize,unit,orgeff/DEP=xgrpeff/ENTER
COMMENT         **********************************************************
COMMENT         Compute frequencies.
COMMENT         **********************************************************
```

```
FREQUENCIES     VARIABLES=superl TO xgrpeff5/
 VARIABLES=ach TO grpeff/
 STATISTICS=ALL/
COMMENT         ********************************************************
COMMENT         Compute Pearson correlation.
COMMENT         ********************************************************
PEARSON CORR    ach1,ach2,ach3,ach4,imach,asgn1,asgn2,asgn3,asgn4,asgn5
 imasgn,cmt1,cmt2,cmt3,cmt4,cmt5,imcmt,comm1,comm2,comm3,comm4,comm5,imcomm
 xcomm1,xcomm2,xcomm3,xcomm4,xcomm5,xcomm6,incon1,incon2,incon3,incon4,imincon
 mgtcon1,mgtcon2,mgtcon3,mgtcon4,immgtcon,role1,role2,role3,role4,role5,imro le
 xrole1,xrole2,xrole3,xrole4,xrole5,xrole6,gpcoh1,gpcoh2,gpcoh3,gpcoh4,gpcoh5
 imgpcoh,xgpcoh1,xgpcoh2,xgpcoh3,xgpcoh4,xgpcoh5,xgpcoh6,xgpcoh7,xgpcoh8
 xgpcoh9,xgpcoh10,xgpcoh11,xgpcoh12,xgpcoh13,id1,id2,id3,imid,indp1,indp2
 indp3,indp4,imindp,int1,int2,int3,int4,int5,imint,orgeff1,orgeff2,orgeff3
 orgeff4,orgeff5,imorgeff,perk1,perk2,perk3,perk4,imperk,dev1,dev2,dev3,dev4
 dev5,imdev,promo1,promo2,promo3,promo4,impromo,rec1,rec2,rec3,rec4,rec5,rec6
 res1,res2,res3,res4,imres,super1,super2,super3,super4,super5,super6,super7
 super8,super9,imsuper,xsuper1,xsuper2,ut1,ut2,ut3,ut4,ut5,imut,wcon1,wcon2
 wcon2,wcon3,wcon4,imwcon,wlife1,wlife2,wlife3,unit1,unit2,unit3,unit4,unit5
 jobsat2,jobsat3,jobsat4,xjobsat1,xgrpeff1,xgrpeff2,xgrpeff3,xgrpeff4,xgrpeff5
 rank,boss,sex,race,rating,branch,base,xjobpos,xsize
 ach TO grpeff/
STATISTICS 1
FINISH
```

AD-A187 134 EVALUATION OF CIVIL ENGINEERING WORK GROUP CHARACTERISTICS RESULTING FROM.. (U) AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYST.. K C WEST

2/2

UNCLASSIFIED SEP 87 AFIT/GEM/LSR/87S-25 F/G 5/1 NL



MICROCOPY RESOLUTION TEST CHART

Appendix E: Pearson Correlation Values
Composite Variables

	Dependent Variable Group Cohesion
Independent Variable	
Communication	r = 0.76 p = 0.00
Group Effectiveness	r = 0.62 p = 0.00
Group Size	r = -0.05 p = 0.23
Job Position Tenure	r = -0.09 p = 0.24
Job Satisfaction	r = 0.67 p = 0.00
Roles	r = 0.71 p = 0.00
Supervision	r = 0.46 p = 0.00

r = Pearson Correlation Values
p = Correlation Probability Values

```
FREQUENCIES     VARIABLES=super1 TO xgrpeff5/
 VARIABLES=ach TO grpeff/
 STATISTICS=ALL/
COMMENT         ***************************************************************
COMMENT         Compute Pearson correlation.
COMMENT         ***************************************************************
PEARSON CORR    ach1,ach2,ach3,ach4,imach,asgn1,asgn2,asgn3,asgn4,asgn5,
 imasgn,cmt1,cmt2,cmt3,cmt4,cmt5,imcmt,comm1,comm2,comm3,comm4,comm5,imcomm,
 xcomm1,xcomm2,xcomm3,xcomm4,xcomm5,xcomm6,incon1,incon2,incon3,incon4,imincon,
 mgtcon1,mgtcon2,mgtcon3,mgtcon4,immgtcon,role1,role2,role3,role4,role5,imrole,
 xrole1,xrole2,xrole3,xrole4,xrole5,xrole6,gpcoh1,gpcoh2,gpcoh3,gpcoh4,gpcoh5,
 imgpcoh,xgpcoh1,xgpcoh2,xgpcoh3,xgpcoh4,xgpcoh5,xgpcoh6,xgpcoh7,xgpcoh8,
 xgpcoh9,xgpcoh10,xgpcoh11,xgpcoh12,xgpcoh13,id1,id2,id3,imid,indp1,indp2,
 indp3,indp4,imindp,int1,int2,int3,int4,int5,imint,orgeff1,orgeff2,orgeff3,
 orgeff4,orgeff5,imorgeff,perk1,perk2,perk3,perk4,imperk,dev1,dev2,dev3,dev4,
 dev5,imdev,promo1,promo2,promo3,promo4,impromo,rec1,rec2,rec3,rec3,rec4,imrec,
 res1,res2,res3,res4,imres,super1,super2,super3,super4,super5,super6,super7,
 super8,super9,imsuper,xsuper1,xsuper2,ut1,ut2,ut3,ut4,ut5,imut,wcon1,
 wcon2,wcon3,wcon4,imwcon,wlife1,wlife2,wlife3,unit1,unit2,unit3,jobsat1,
 jobsat2,jobsat3,jobsat4,xjobsat1,xgrpeff1,xgrpeff2,xgrpeff3,xgrpeff4,xgrpeff5,
 rank,boss,sex,race,rating,branch,base,xjobpos,xsize/
 ach TO grpeff/
STATISTICS 1
FINISH
```

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ABSTRACT

The purpose of this study was to evaluate from the perspective of group behavior the reorganization of Strategic Air Command (SAC) Civil Engineering Operations Branches into maintenance work groups. The study had three basic objectives: (1) Evaluate the validity and the reliability of the survey instrument used in the study. (2) Evaluate the usefulness of a theoretical group behavior model as a group behavior measurement tool. (3) Compare the job related attitudes, group characteristics, group processes, and perceived group effectiveness within a reorganized Operations Branch to the job related attitudes, group characteristics, group processes, and perceived group effectiveness within a non-reorganized Operations Branch.

The study resulted in the validation of the survey instrument and verification that the theoretical group behavior model could be used as a group behavior measurement tool in the field.

The reorganized Operations Branch was perceived by the survey respondents to be more effective and to have better supervision than the non-reorganized Operations Branch. No significant differences in job related attitudes, group cohesion, roles, communication, decision making, or unit development were found between the reorganized Operations Branch and the non-reorganized Operations Branch. Recommendations made as a result of these findings include: conduct a longitudinal study with additional bases and collect specific production measures so that the survey results may be compared and verified using common production measures.

This study did establish a foundation on which an accurate assessment of change in organizational processes can be made. The validation of the survey instrument and group behavior model provides that foundation.

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